

6-2004

# The Great American Neighborhood: Contemporary Design Principles for Building Livable Residential Communities. 2004

Maine State Planning Office

Terrence J. DeWan & Associates

Kent Associates

Follow this and additional works at: [http://statedocs.maine.gov/spo\\_docs](http://statedocs.maine.gov/spo_docs)

---

## Recommended Citation

Maine State Planning Office, Terrence J. DeWan & Associates, and Kent Associates, "The Great American Neighborhood: Contemporary Design Principles for Building Livable Residential Communities. 2004" (2004). *State Planning Office*. Paper 49. [http://statedocs.maine.gov/spo\\_docs/49](http://statedocs.maine.gov/spo_docs/49)

This Document is brought to you for free and open access by Maine State Documents. It has been accepted for inclusion in State Planning Office by an authorized administrator of Maine State Documents. For more information, please contact [statedocs@maine.gov](mailto:statedocs@maine.gov).



# **The Great American Neighborhood**

**Contemporary Design Principles for Building Livable Residential Communities**



**Maine State Planning Office  
GrowSmart Maine**

**Terrence J. DeWan & Associates  
Kent Associates**

**JUNE 2004**

**One of a series of monographs** from the Maine State Planning Office addressing sprawl.

See also:

*Creating Walkable Neighborhoods: A Handbook for Maine Communities.* Publication pending.

*Markets for Traditional Neighborhoods, An Analysis of a Survey of Recent Homebuyers in Maine.* August 1999.

*Why Households Move: Two Maine Surveys.* August 1999.

*Markets for Traditional Neighborhoods in Mid-coast Maine. A Survey of Residents Living in Midcoast Maine Regarding Preferences in Home Location along With Analysis of Housing Demand.* April 2003.

*Cost of Sprawl,* May 1997.

This document was prepared with funds from the Maine Coastal Program/State Planning Office under financial assistance provided by the Coastal Zone Management Act of 1972, as amended, administered by the Office of Oceanic and Coastal Resource Management, National Oceanic and Atmospheric Administration, under award #NA77020187 and #NA87OZ0235 and with funds from GrowSmart Maine under financial assistance from the Maine Community Foundation. This document was printed by the Maine Coastal Program/State Planning Office under financial assistance provided under General Fund account #010-07B-2907-012.

**Principal authors:** Beth Della Valle; Terrence DeWan, Terrence J. DeWan & Associates; Brian Kent, Kent Associates; Evan Richert.

**A project of the Maine State Planning Office**  
**Land Use Team:** Beth Della Valle, Coordinator, John DeVecchio, Judith East, Frank Hample, Mary Ann Hayes, Will Johnston, Fred Landa, Matthew Nazar, Harold Payson, Liz Rettenmaier, Paula Thomson.

**Research assistance and consultation** provided by Market Decisions, Inc. and Planning Decisions, Inc., under the direction of Mark Eyeran.

**Special thanks** to the Great American Neighborhood Advisors: Richard Berman, Judy Bernstein, Diane Brandon, Tish Carr, Paula Craighead, Rozanne Eflin, Tom Emery, Andy Fillmore, Mike Finnegan, Kathy Fuller, Tex Haeuser, Bruce Hensler, Theo Holtwijk, Kevin Hooper, Chris Glass, Bob Georgitis, Judy Hashem, Todd Janeski, Bob Lefebvre, Kathleen Leyden, Christine Lyman, Tom Martin, Phil McGouldrick, Peter Monro, Gerald Mylroye, Bill Najpauer, Jim Nimon, Jeff Nims, Ron Owens, Nat Salfas, Ron Smith, Ed Suslovic, Jeff Tarling, Bill Taylor, Joe Thomas, Bill VanTwisk.

**Photography** by Terry DeWan, George Theborge, and Reggie Parker.

**Illustrations** by Kent Associates, Terrence J. DeWan & Associates, Dan Morabito, Bruce W. Towl, and Michael Worobec.

**Cover Illustration** by Bruce W. Towl, Dover-Foxcroft, Maine.

**Photographs** taken in the following Maine communities are used in this publication: Bath, Belfast, Biddeford, Brunswick, Camden, Cumberland, Freeport, Gorham, Hallowell, Northport, Portland, Rockland, Saco, Thomaston, Waterville, Windham, Yarmouth.

**Maine State Planning Office**  
38 State House Station  
Augusta, Maine 04333  
(207) 287-6077  
[www.maine.gov/spo](http://www.maine.gov/spo)

**GrowSmart Maine**  
Sparhawk Mill Building  
81 Bridge Street  
Yarmouth, Maine 04096  
(207) 847-9275  
[www.growsmartmaine.org](http://www.growsmartmaine.org)

# **The Great American Neighborhood**

**Contemporary Design Principles for Building  
Livable Residential Communities**

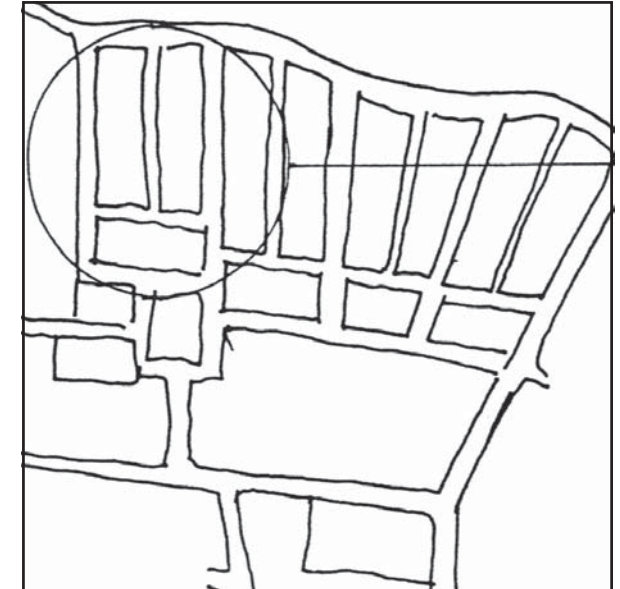
**Maine State Planning Office  
GrowSmart Maine**

**Terrence J. DeWan & Associates  
Kent Associates**

**JUNE 2004**



# CONTENTS



## I. Introduction ..... 1

Background  
Purpose  
Neighborhood Design: An Alternative to Sprawl  
What Do Buyers Want?  
Market Segments: Promising Targets  
What Makes a Great Neighborhood?  
Conventional Subdivisions vs. Great American  
Neighborhoods: An Overview  
Some Historic Maine Examples

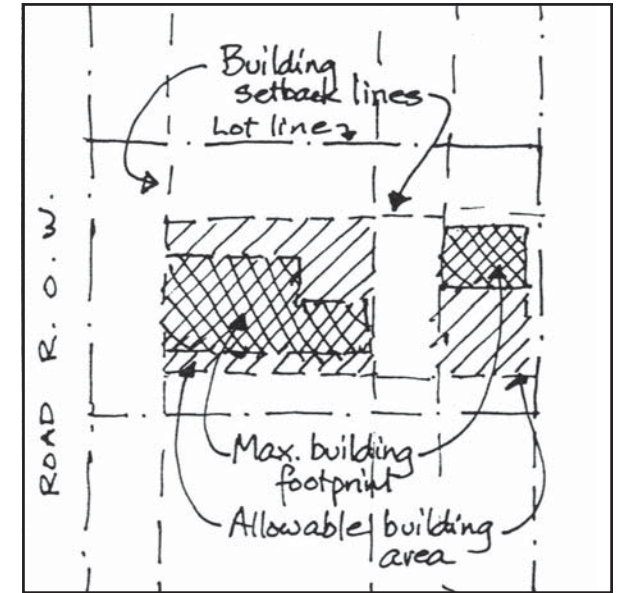
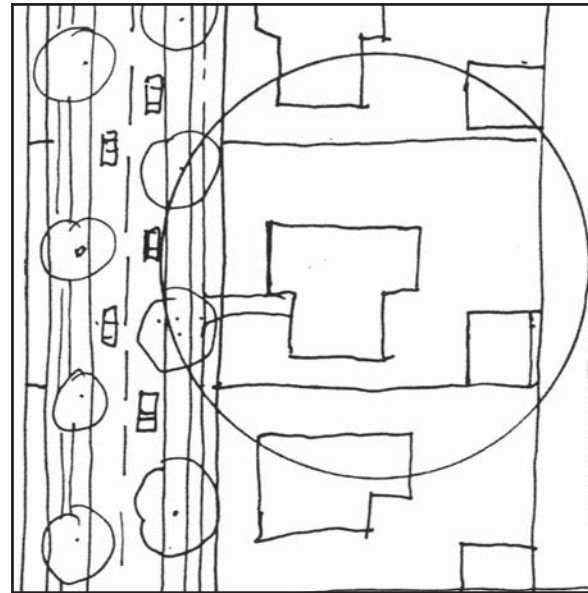
## II. Site Selection ..... 9

Types of Sites

- Village Fringe Sites: Growth on the Edges
- New Neighborhoods in Growth Areas
- Infill Sites

## III. Project Planning ..... 11

Overview  
Planning and Design Process  
Examples of Projects  
Project Planning Checklist  
Open Space and Civic Amenities  
Mixed Use Neighborhoods  
Parking Area Design  
Winter Maintenance



#### IV. Grid, Block and Street Design ..... 25

Street Planning for Livable Neighborhoods  
 Street Patterns: Variations on the Grid  
 Some Variations on Block Patterns  
 Safety and Street Design  
 Street Cross Section: The Public-Private Realm  
 Sidewalks, Esplanades, and Pathways  
 Landscaping the Street  
 Design Quality in the Public Realm  
 Minor Roads  
 Alleyways

#### V. Lot Layout ..... 43

Overview: Creating a Neighborhood  
 Density  
 Lot Width and Frontage  
 Lot Depth and Shape  
 Corner Lots  
 Usable Outdoor Spaces

#### VI. Home Siting and Design ..... 53

Overview  
 Porches and Entrancesways  
 House Design / Orientation  
 Privacy  
 Architectural Guidelines  
 Garage Siting and Design  
 Front Yard Design  
 Fencing the Lot

#### Appendices ..... 61

A. Maine's Principles of Smart Growth  
 B. New Urbanism Basics  
 C. Suggested Street Trees  
 D. Suggested Home and Open Space Plantings

E. Sources of Additional Information  
 F. Potential Sources of Financial Assistance  
 G. How to Make Growth Areas Work Without  
 Public Sewers



# I. INTRODUCTION

## BACKGROUND

Over the past several decades residential developers in Maine have built roads, subdivided land, and sold lots. Lots of lots. The size of the lots, the design of the roads, and indeed the quality of the places being built have been largely dictated by zoning and subdivision ordinances. By and large, this process has not created neighborhoods in the traditional sense.

In focusing on the *quantitative* aspects of land subdivision – such as stormwater management, traffic impacts, and utility service – communities have done little to encourage the *qualitative* elements that make livable, attractive, diverse neighborhoods. In many cases, local regulations discourage these important attributes. Town policies and ordinances seldom encourage the creation of community spaces and safe streets found in traditional neighborhoods.

Recent research by the Maine State Planning Office shows significant consumer demand for new homes in ‘traditional neighborhoods.’ Thirty-seven percent of homebuyers in Maine are looking for more than a home on a rural or suburban lot. They want safe, walkable neighborhoods with a sense of community, civic amenities, and convenient access to goods and services.

Developers in Maine have yet to tap into this market. The opportunities await.

## PURPOSE

This Guide provides residential developers, homebuilders, and town officials with a set of principles and design ideas that can be used to create the livable, quality neighborhoods that homebuyers are looking for. When adapted to fit specific sites and projects, these principles can help developers respond to these market preferences, stem sprawl, and direct growth to selected ‘growth areas’ within the community.

Across the nation developers are tapping these markets and building new neighborhoods based on the time tested design concepts illustrated in this Guide. The results have been referred to as ‘traditional neighborhood design’ (TND), ‘new urbanism,’ ‘neo traditional design,’ or ‘the Great American Neighborhood.’

Whatever they are called, these new neighborhoods must meet the demands of today’s consumers. They must provide desirable public places, as well as essential private spaces. They must be attractive, safe, quiet, and affordable.

The challenge is to translate terms such as ‘community,’ ‘convenience,’ ‘walkability,’ ‘safety,’ and ‘diversity’ into bricks and mortar, into livable, built environments.

The planning and design of these places involves thinking at different scales and levels of detail. The case studies and real world examples in this Guide will help you understand the elements that make up vibrant, marketable, traditional neighborhoods.

Of course, most developers do not build whole communities. The principles in this guide apply to small ‘infill’ projects and compact new neighborhoods as well as to large, multi year developments. The key is to see each project as part of a community building process, where all new homes, streets, and open spaces contribute to the betterment of the neighborhood because they follow good design principles. With forethought and imagination, and cooperation from the public sector, developers can be the moving force behind the creation of livable neighborhoods.

***‘This Guide provides... a set of principles and design ideas that can be used to create livable, quality neighborhoods.’***





## NEIGHBORHOOD DESIGN AN ALTERNATIVE TO SPRAWL

Traditional neighborhood development can be an antidote to sprawl. Sprawl ruthlessly consumes rural land and erodes the social capital that binds a community together. Further, there are hidden costs to sprawl that show up as increasing taxes for services, schools, new roads, maintenance and repairs, degraded water and air quality, and loss of open space, wildlife habitat, and community character.

Maine has taken a market based, 'smart growth' approach to the problem of sprawl. Three major concepts underpin this approach:

- **People should be free to choose where they want to live**, but they should also be willing, as individuals, to pay for their decisions.
- **Healthy organisms don't die.** If our villages, town centers, and cities are desirable places to live, they will hold their own. Similarly, if resource based enterprises in our rural areas are healthy, they will better resist the negative, cumulative effects of sprawl.
- **Developers don't cause sprawl.** They implement public policy. While they are not passive bystanders, they have a financial incentive to follow established town standards in building and selling their products. If obstacles to quality neighborhood design are removed, responsible patterns of development can be proposed in designated growth areas. The market for traditional community design is there, waiting for public policy to catch up.



## WHAT DO BUYERS WANT?

The State Planning Office report titled 'Markets for Traditional Neighborhoods' shows that many homebuyers moving to suburban or rural settings are not totally satisfied with their decision. The homes they end up purchasing often fail to meet their needs. Two other State Planning Office reports, 'Why Households Move: Two Maine Surveys' and 'Markets for Traditional Development in Midcoast Maine – Summary Report' reinforce this finding. All three reports can be found on line at: [www.maine.gov/spo/landuse/pubs/index.php](http://www.maine.gov/spo/landuse/pubs/index.php)

This dissatisfaction opens up new, largely unexplored opportunities for developers willing to cater to a strong, but underserved segment of the Maine housing market. The State Planning Office

report concludes: 'If traditional neighborhood alternatives are offered in the marketplace, a significant share of homebuyers will choose them.'

What specifically are these buyers looking for? Research and discussions with recent homebuyers in focus groups in central and southern Maine found that this segment of the market is seeking:

- convenience and proximity to services and amenities
- a well designed setting with trees and greenery
- opportunities for community and places to socialize
- assurance of privacy and quiet
- limited traffic
- diversity
- access to nature and
- 'walkable neighborhoods.'

*'Traditionalists can rest assured: the antidote to sprawl is not some frightening planning fad from away, but a convivial and convenient lifestyle that is native to Maine.'*

*A new kind of subdivision that employs higher densities, varied housing types and mixed residential and commercial uses has been labeled the Great American Neighborhood... Models... can be found all around Maine, in old fashioned urban and village centers...*

*Sprawl is expensive, wasteful and hard to reverse, so its reassuring to know that the best weapon against it is already here in our own back yard.'*

**Portland Press Herald, Oct. 15, '02**

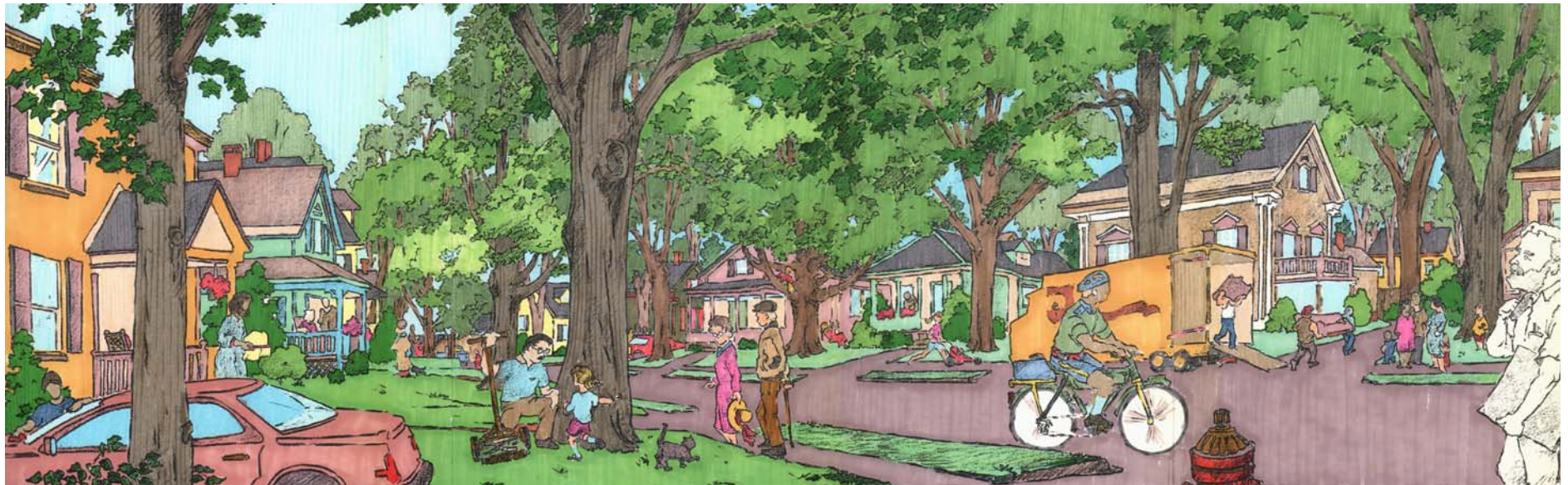


Illustration by Bruce M. Towl, Dover-Foxcroft, Maine

## MARKET SEGMENTS PROMISING TARGETS

### Research Findings

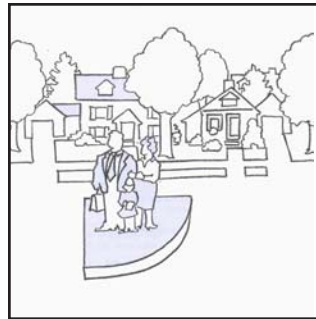
The research on recent homebuyers identified five market segments, each with a distinct set of values. Some desire to socialize with neighbors; others want to be close to stores, services, and meeting places; others are looking for natural, attractive settings. The groups contain a broad range of ages, incomes, and urban/rural residents. The defining characteristics of each group were the mix of values they deemed important.

### Market Opportunities

The research found that many of the people who favored social interaction and proximity to community centers were actually moving to places where these needs were not being met or were unlikely to be met.

Three of the five groups – Small Town Civics, Young Turks, and Introspectives – are potentially strong markets for traditional neighborhoods. Among these groups are households moving out

to suburban or rural settings, despite their values and preferences. To capture this latent, but important market, developers and communities need to stress convenience, alternatives to sprawl, proximity to services and community facilities, safety, privacy, and opportunities for social interaction in a well planned setting. These consumers seek neighborhoods where green space and conveniences are not mutually exclusive.

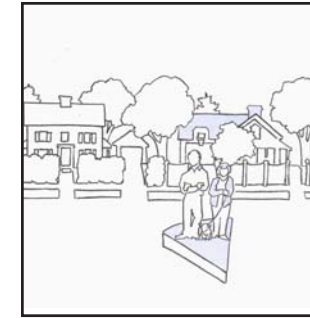


Illustrations by Bruce M. Towl

**Small Town Civics**, mostly in their middle and later family years, are buying homes on 1/2 acre or less in residential settings. They value neighborhoods, natural settings, and opportunities to walk to stores and services.

*Market emphasis for this group should be positive, stressing neighborhood, community, and convenience. The message should include the effect of sprawl on wildlife habitat, farmland, woodland, open space preservation, and taxes.*

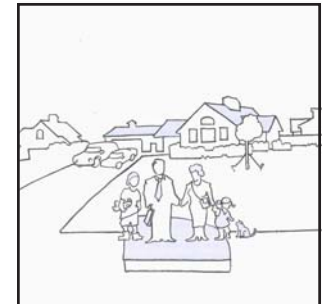
**Young Turks**, the youngest of the groups, prefer urban settings and tend to be in professional and administrative positions. They are buying small lots, 1/2 acre or less, and value proximity to gyms, ballfields, and cultural facilities. *Market emphasis should focus on affordability and the convenience of living in or near town.*



**Introspectives** tend to be older, of moderate to middle income, and desire privacy and convenient access to services. They tend to live on smaller lots in service center communities.\*

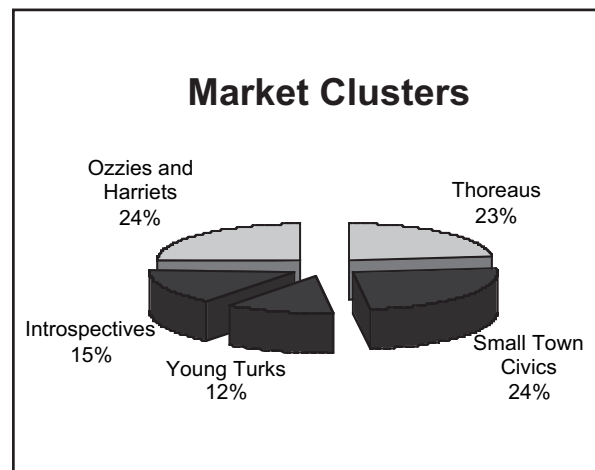
*Market emphasis should be on providing home designs and site plans that afford privacy and quality landscaping. Marketing messages should emphasize convenience and proximity to services.*

In addition to these three groups, some **Ozzies and Harriets** may also respond well to the concepts of traditional neighborhood development. These are people with young children or teenagers who usually seek child oriented neighborhoods. *Market emphasis should identify sprawl as harmful to wildlife habitats, farms, woodlands, and open space. The message should contain positive images stressing community and neighborhood values.*



The fifth group – **Suburban Thoreaus** – is not considered a market opportunity for traditional neighborhoods.

\* "Service center communities" are towns that provide a range of employment, retail, social, and cultural services not found in the small, surrounding towns and villages.





## WHAT MAKES A GREAT NEIGHBORHOOD?

### Past Patterns

Great American Neighborhoods, or remnants thereof, can be found in many Maine communities. They are the compact neighborhoods where many Mainers grew up. Unfortunately, many of these places are a bit worn around the edges. Often streets that typically form their boundaries have evolved into commuter arterials that carry suburbanites to their jobs in central communities.

Even today, if a homebuyer wants a new home somewhere other than in the country or a suburban development, choice in the market place is limited. Most local land use ordinances almost uniformly prohibit traditional neighborhood and village design. Town officials often do little to encourage in town housing or extend roads and sewers to areas suitable for new neighborhoods. And even when these services are present, towns usually require greater lot sizes than are desirable to support compact, traditional neighborhoods.

Homebuilders have been building little beside suburban homes for so long, they are skeptical there is any other market. Consumers, confronted with older in town neighborhoods afflicted with noise, traffic, and deterioration assume there is no alternative but to move outward. And that is what most do.

### Neighborhood Features

If many Maine homebuyers are likely candidates for an alternative to suburban subdivision or more isolated rural house lot, what exactly are they looking for?

Great American Neighborhoods in Maine have a number of nearly universal features\*:

- **They are compact, safe, and walkable** from end to end. A walkable neighborhood is defined by the distance a person can walk in about 10 minutes. People are less likely to think of areas farther away as part of their neighborhood.
- **They offer elements of surprise, variety, and variability.** They have a diversity of housing types and a mix of neighborhood uses. Homes are attractive and well sited on reasonably sized lots with private outdoor spaces. Lot sizes often vary to cater to two or more market segments. Differences in building design, architectural detail, landscaping, and side yard setbacks break the mold of a cookie cutter pattern. Unique and varied treatments of side yards surprise and delight the senses as one traverses the streetscape.
- **There is a network of interconnected streets** with few dead ends. Streets are narrow and designed to minimize speeding and shortcuts. Local streets do not carry through traffic. They also have strong links – via sidewalks and trails – to adjoining neighborhoods, schools, shopping areas, and parks.
- **They have a recognizable identity and boundaries** that separate one neighborhood from another. They may also have a green or a crossroad with civic buildings, community center, and/or small shops and services that is readily recognizable and often gives the neighborhood its identity.

---

\* See page 8 for examples of village neighborhoods with these features.

- **They have a human scale** that makes people feel comfortable in them. Civic amenities, landscaped streets, shaded sidewalks, and open space enrich the quality of life in these neighborhoods.
- **They provide for both chance meetings and personal privacy** through their street, pedestrian network, and lot design. The ‘public face’ of most houses (front door, porch, front yard) faces the street, increasing the opportunity for chance meetings with neighbors. There are also places for planned meetings, from common greens to public community centers. Back yards are private.
- **They offer a connection to nature** through a consciously designed open space system. The open space system is made up of formal elements (tree lined streets, walkways, parks, greens), recreational elements (playgrounds, fields, courts), and informal elements (trails, buffer zones, wildlife habitat, preserved natural features, scenic views). All three types of open space are critical to creating a ‘livable’ neighborhood that balances the public with the private, the convenient access of town with the restorative power of nature, the best of the city with the contemplative tranquility of the country.

### Density

A key to successful Great American Neighborhood design is density of development (i.e., the number of dwelling units/acre). The density will vary, depending on the community and the setting. It could be as low as 2 units/acre in smaller towns without municipal sewer and water to as high as 16 or more units/acre in urban areas.

## CONVENTIONAL SUBDIVISIONS V. GREAT AMERICAN NEIGHBORHOODS: An Overview

ELEMENT	CONVENTIONAL SUBDIVISIONS	GREAT AMERICAN NEIGHBORHOODS
<b>Planning Process</b>	A two dimensional exercise in manipulating lot lines and roads, avoiding wetlands and maximizing site capacity. Developers build 'projects' and sell lots. Design team includes surveyor, engineer, wetland scientist, soils scientist.	A three dimensional process that results in spaces for human enjoyment and environmental protection. Developers build communities. Design team may include landscape architect, surveyor, civil engineer, wetland scientist, and soils scientist.
<b>Relationship to the Community</b>	Relatively isolated, often in rural settings, away from designated growth areas. Automobile is primary (if not only) way of connecting to rest of community. Auto traffic funnels through a single or few points of access.	Integrated into community's growth area and transportation network; paths are extended; traffic is dispersed. Within walking and bicycling distances of municipal services. Opportunities for convenient access to existing and future bus and rail stops.
<b>Types of Homes</b>	Homogenous, with little variation in type, size, appearance, or price range of homes.	Heterogeneous. Variety of lot sizes, housing types, styles, sizes, and living opportunities. Harmonious relationship among the different homes helps define the spaces that create the neighborhood.
<b>Privacy</b>	Responsibility of homeowner to create privacy through siting, landscaping and modifications to house. Often achieved through sheer space – distance from neighbors, large lot size – rather than by design.	Responsibility of the developer, starting with site selection, road design and continuing through house siting, architectural design. Landscaping helps define lot boundaries.
<b>Lot Size and Road Frontage</b>	Prescribed by zoning and subdivision ordinance. Lots typically range from 1/2 to 2+ acres, with 100-200' wide lots. The results are long frontages and somewhat lengthy, unimaginative blocks.	Variable with location, available services, target densities, topography, existing trees, etc. May range from 5-10,000 SF± in urban areas and 1/2 to 1 acre in fringe areas. Mixed lot sizes and frontages within neighborhood. Results in reduced frontages, interesting blocks.
<b>House Siting</b>	Setback determined by zoning, typically 35'-50' from edge of right-of-way. Homes oriented parallel to the road. Little relation to human scale or the street. Large, often unused front lawns. Lack of privacy in back yards.	Modest setback of 10-25' to give scale to the street. Homes often oriented perpendicular to street. More private and usable back yard space. Grade changes often used to provide separation between public/private spaces.
<b>Common Open Space</b>	Often no common open space. If present, not usable or well suited for common use. Often located at edges of the development. Rarely located or designed to be attractive places for people to meet, linger, or walk. Cluster subdivisions may dedicate 20-50% of the land as open space, but it is often 'left over' or unusable land of marginal quality for human activities. The dedicated land is generally not integrated into the neighborhood or linked to adjacent open space.	30-50% of the land set aside as open space system (esplanades, greens, ballfields, trail corridors, wildlife habitat, natural areas). Open space gives character to the neighborhood, establishes buffers, preserves significant features, and provides park and play spaces. Attractive places for people to meet and linger are integrated into the neighborhood. Often includes a centrally located component that provides both formal and informal opportunities for people to meet and interact.



## CONVENTIONAL SUBDIVISIONS

An integral and often visually dominant part of the public face of the home. Driveways are a predominant part of the streetscape.

Design standards set by local ordinance are often wider than necessary and oversized for the intended use. Cul-de-sacs and dead end streets keep unwanted traffic out of neighborhoods. Traffic calming measures may be added to slow traffic.

Often waived or only built on one side of the street. No esplanades. Not usually thought of as part of a transportation network that links to larger, community wide system. Often not considered necessary because development is not within walking distance of community activities.

Rarely required by municipal ordinances in new subdivisions. Greater emphasis is put on protection of existing trees. When trees are planted, ornamentals are often used that will not exceed 20' in height, or they are spaced too far apart to offer shade or canopy over sidewalk/street.

Emphasis is on aiding motorists: lighting major intersections and curves on the roadway to make drivers aware of potential hazards. Dark areas often occur between pools of light. Tall fixtures are out of scale with the pedestrian.

High quality curbs rarely used due to costs associated with wide lots. Cape cod curbs used to blend roadway into the landscape, but may allow parking on lawn or esplanade. Often absent in rural settings.

In individual driveways or in attached garages. Parked cars are only occasionally seen on the road.

## GREAT AMERICAN NEIGHBORHOODS

Garages are important but not visually prominent, often set back from the house. Access may be off a service drive at rear, a shared driveway, or the street.

Designed for multiple users – moving and parked cars, pedestrians, bicyclists, occasional emergency vehicles – in scale with intended uses. Interconnected streets designed to discourage through traffic, limit speeds, and encourage convenient access and walkability.

An integral part of the open space system. Generally on both sides of the street. Treated as social spaces, defined by shade trees and pedestrian scaled lights. Esplanades help separate and protect the pedestrian. Walks may not be needed on low volume streets.

Critical component of open space system. Trees add scale, shade, and visual interest to the street. Shade trees will grow taller than houses suggesting protection and permanence. Opportunity to use a variety of trees and other plantings to add personality to the street and encourage pedestrian activity.

The street and sidewalk are lit evenly to aid motorists and pedestrians – to encourage safe vehicle and pedestrian movement. Fixtures are scaled to the pedestrian while lighting the road.

Closed drainage systems with quality curbing for long term maintenance, appearance, and pedestrian safety. Vertical curbs allow wider esplanades for tree planting.

On street parking can be an integral part of the roadway design – helping to calm traffic and create a more protected pedestrian environment. Parking can also be provided off alleys or in driveways, in garages attached to or detached from the house. Snow removal may require seasonal restrictions on overnight parking and/or locations for off street parking.

## ELEMENT

### Garages and Driveways

### Streets

### Sidewalks and Esplanades

### Street Trees

### Street Lights

### Curbing

### Parking



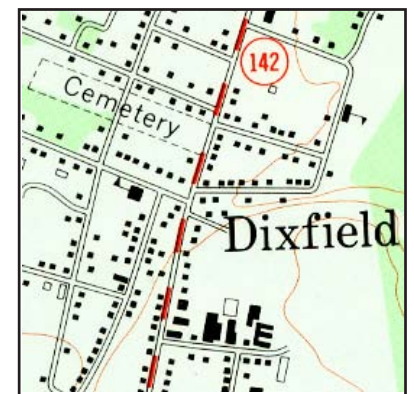
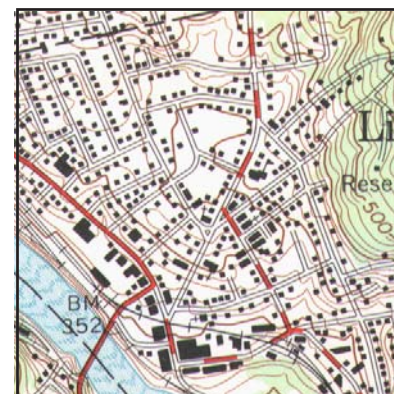
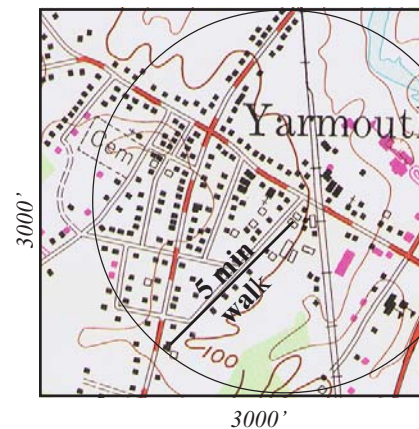
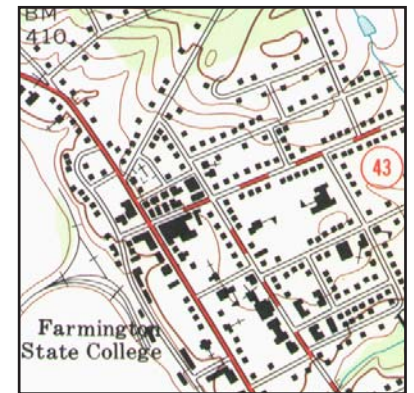
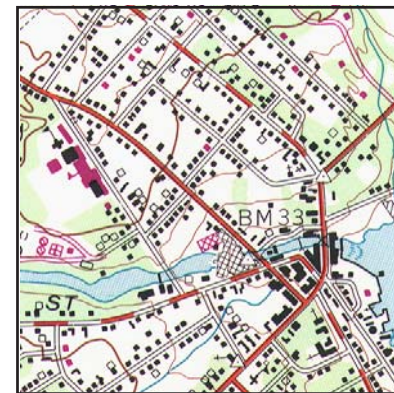
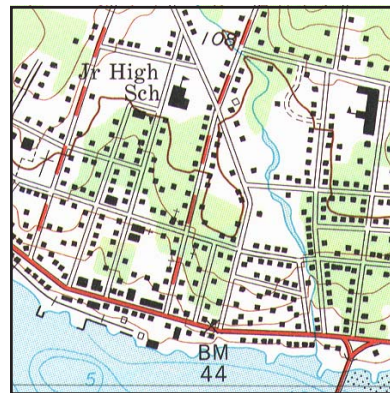
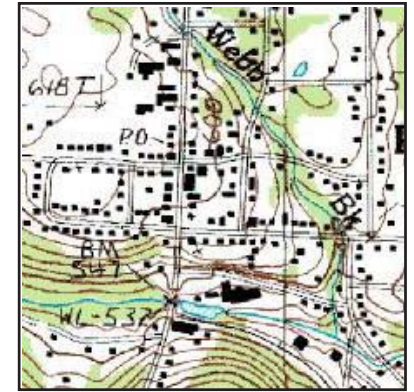
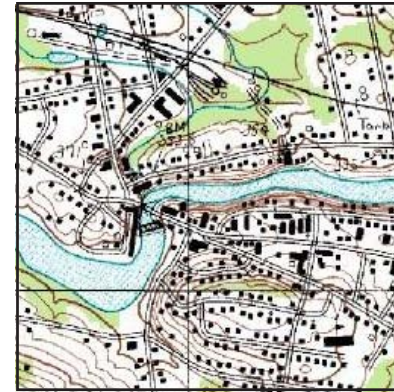
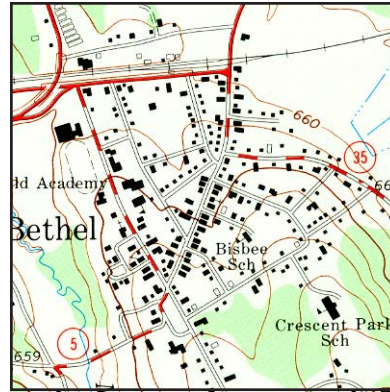
## SOME HISTORIC MAINE EXAMPLES

Upon closer inspection, you will discover a number of places in Maine that have many of the characteristics of a Great American Neighborhood. Trolley or streetcar suburbs, developed at the turn of the century, are one of the best places to look. These include Meetinghouse Hill and Loveitt's Field in South Portland, Cape Cottage in Cape Elizabeth, Deering in Portland, and Wildwood in Cumberland.

Many other examples can be found within easy walking distance of town and city centers: the Pearl Street neighborhood in Camden, Yarmouth Village, the South End and North End of Bath, many of the streets around Bowdoin College in Brunswick, and Farmington Village. Great walkable neighborhoods are also found in Augusta, Bangor, Bar Harbor, Belfast, Biddeford, Bethel, Ellsworth, Hallowell, Harrison, Kingfield, Livermore Falls, Machias, Millinocket, Old Town, Rockland, Rockport, Rumford, Thomaston, and York just to name a few. USGS maps from some of these places are shown on the right.

Typically these older neighborhoods feature a grid of streets, irregular blocks of houses on variably sized lots, and stores, a main street, and/or schools – all within an easy walking distance.

Most people tend to walk about 250-300 feet in a minute (about the length of a football field). In ten minutes they can cover about half a mile. In this time they can walk anywhere within an area of 100-250 acres. The examples on this page are 3000 feet on a side, covering about 200 acres.



Bethel  
Bucksport  
Yarmouth

Dover-Foxcroft  
Camden  
Livermore Falls

Patten  
Farmington  
Dixfield



10 Acres



## II. SITE SELECTION

### TYPES OF SITES

Several basic types of sites are suitable for Great American Neighborhoods:

- **Village Fringe...** growing outward, on the edge of an existing village or town.
- **Growth Areas...** new neighborhoods in growth areas, designated by local comprehensive plans.
- **Infill...** new pockets of development or opportunities for redevelopment, within existing urban areas.

#### Village Fringe Sites Growth on the Edges

Land that may be suitable for Great American Neighborhoods often lies just beyond the central core of the community, but within easy walking or biking distance to schools, the library, stores, parks, and other residential neighborhoods. Perhaps it is along a bus route. Such properties may have been passed over due to concerns for wetlands, lack of town services, or a host of other reasons. Or, they may never have come on the market. Remember:

- Fringe properties are often informally 'claimed' by abutters as neighborhood open space. In these situations it is especially important to work with the local residents to develop a workable plan to incorporate existing trails, provide community open space, and minimize traffic impacts.



*An example of a village fringe site within walking distance of an established community.*

- Since many fringe properties are often not zoned to accommodate compact densities, expect to go through a rather lengthy public process. Better yet, seek out properties that are zoned appropriately. Support from local residents in the early stages is often a key to success.
- It may be difficult to assemble enough land to achieve an optimum size neighborhood. Consider planning your project so it can be expanded in the future if/when more land becomes available.

- To garner community support, explore creative ways to increase the attractiveness of the project. For example, the municipality may be amenable to increasing density in exchange for purchasing development rights to property outside the growth area. Or you might want to consider a per lot contribution toward the purchase of conservation land to keep it off the market. These are complex negotiations which should be coordinated by an experienced real estate attorney.

#### New Neighborhoods in Growth Areas

Many communities have designated growth areas where future development is anticipated. However the municipality may not have changed its zoning to implement the growth areas as yet. Another State Planning Office publication, *Creating Walkable Neighborhoods: A Handbook for Maine Communities*, advises communities on desirable densities, mixed uses, and road designs for growth areas. The Handbook is also designed to help developers in their discussions with towns. In areas already zoned for growth:

- Look for opportunities to expand your new neighborhood onto abutting properties as land becomes available. Open space systems should be coordinated with the community's long range vision for habitat protection, stormwater management, and greenbelts. The site analysis should identify potential points of public access, as well as land which is best left undeveloped.



*An example of land in a growth area, served by existing roads, next to a school, walkable to the downtown.*

- Plan the street network so it meshes with long range plans for off site roadway and public transportation improvements. The community may have already designated future roads on an official map as an outgrowth of its comprehensive plan. In these situations, developers will be expected to locate streets within a certain corridor and to build them to specific standards. Consider sites with convenient access to existing and planned bus stops or near a proposed transit route or train station.
- Consider the pro's and con's of land near commercial areas. Evaluate the effects of noise, traffic movement, and light 'spillage.' Recognize that new roadways off designated arterials may be restricted by Maine Department of Transportation access management regulations.
- Consider the advantages of building a new neighborhood, with an integrated network of

streets and walkways, adjacent to existing or planned neighborhood commercial or mixed use development.

- In larger projects, the developer might propose or the municipality may require the dedication of land for future community use, e.g., a school, community center, or athletic facilities. Preliminary planning should identify the optimum location for such facilities in order to integrate them into the circulation network, open space system, and stormwater management facilities, while minimizing noise, lighting, traffic, and runoff impacts.

### **Infill Sites**

Infill properties may be quite suitable for Great American Neighborhoods. These sites present opportunities to reinforce the fabric of the community and upgrade its image. Public utilities are generally in place, although they may need to be updated.

Because nearby residents may be concerned about loss of open space, increased congestion, and traffic, work with neighborhood groups throughout the process. Stress how development will add long term value and stability to the community.

- Consider purchasing several infill sites in close proximity to each other to recreate the feel of an older neighborhood and to provide a mix of new and old homes.
- Urban infill sites offer opportunities for mixed use, such as neighborhood service, retail, and office uses, that may not be possible in less built up areas.

- Adaptive reuse of existing buildings – especially commercial or industrial structures – can add an exciting dimension to a community. Nearby historic structures can inspire architectural forms and details and provide focal points for streets and open spaces.
- The demand for parking might be lessened in urban areas if public transportation is in close proximity. Local officials may be willing to relax parking standards to attract quality new development.
- Some brownfield sites may offer potential for redevelopment as mixed use neighborhoods. They are often close to community services, shopping areas, and public transportation. With proper treatment, and possibly with Federal assistance, their transformation can be a welcome addition to the community.



*An example of an infill site: an abandoned mill surrounded by established neighborhoods and commercial areas.*

# III. PROJECT PLANNING

## OVERVIEW

The average person can walk to any part of a 100-acre tract of land in about five minutes, starting in the center. In ten minutes, this area increases to about 250 acres. For planning purposes, the optimum size of a Great American Neighborhood will vary greatly, depending upon many factors.

Few Maine developers take on projects of 100 acres or more. If your goals are smaller, or if you are concerned about adverse neighborhood reaction to too large a project, build a portion of a Great American Neighborhood. After all, that's how many of our communities were built in the past.

What would be in a typical new neighborhood on a 50–100 acre sewered site in a medium sized town in Maine?

- Approximately 1/3-1/2 of the land would be set aside for open space purposes: village commons, recreation fields, parks and playgrounds, trail corridors, wildlife habitat, buffers, and other public or commonly held land.
- Overall gross densities can vary, but in this example 2 units per acre would not be unrealistic for single family homes. The density could rise considerably if senior housing, apartments, townhouses, condominiums, or other forms of housing were added to the mix.
- For single family homes, typical lot sizes might range between 5,000 and 15,000 square feet, with an average of about 1/4 acre.

- Variability in lot sizes and frontages are common in order to respond to unique site conditions and add variety to the streetscape.
- This model would result in about 100-200 units of housing, or 250-500 people. If commercial land use is adjacent to another neighborhood, a larger commercial core might be supported. Ideally, such a site should be located next to neighborhood commercial land and within walking distance of other facilities.

The plan and unit mix of any new neighborhood will depend on many factors... zoning, market demands, site conditions, abutting land use, etc. A Great American Neighborhood approach to development can work on a variety of sites throughout the State. The table below suggests that project size and density will vary to fit the scale of the community. Keep in mind that final densities could be considerably higher.

	SMALL TOWN	MIDSIZED TOWN	URBAN AREA
<b>Total Area</b>	10 to 50 ac.	20 to 100 ac.	150 to 250 ac.
Formal Spaces	1 to 2 ac.	1 to 3 ac.	1 to 5 ac.
Recreation Areas	1 to 5 ac.	1 to 8 ac.	8 to 15 ac.
Natural Areas	2 to 25 ac.	6 to 50 ac.	35 to 60 ac.
<b>Dwelling Units</b>	10 to 50	50 to 200	400 to 800
Gross Density	1 unit/ac.	1.5 to 3.5 units/ac.	2.5 to 3.0 units/ac.
Average Net. Res. Density	1.5 to 2.5 units/ac.	2.5 to 4.0 units/ac.	4.0 to 5.0 units/ac.
Net. Res. Density (Range)	1.5 to 4.0 units/ac.	2.5 to 8.0 units/ac.	2.0 to 15.0 units/ac.
<b>Lot Sizes</b>	15,000 to 40,000 SF	5,000 to 15,000 SF	5,000 to 10,000 SF
<b>Population</b>	25 to 125	50 to 1,000	1,000 to 2,000
<b>Local Retail/Service Space</b>	n/a	small store to 10,000 SF	10,000 to 40,000 SF
<b>Civic Space</b> (Churches, day care, municipal buildings, schools, fire stations, etc.)	< 1 ac.	1 to 4 ac.	4 to 8 ac.

Based on *Visions for a New American Dream: Process, Principles, and an Ordinance to Plan and Design Small Communities*. Anton Clarence Nelessen. APA Planners Press, 1993.



## PLANNING AND DESIGN PROCESS

### Critical First Steps

From a developer's perspective, a successful Great American Neighborhood results from a 'smart' process, involving the community in every step along the way.

- **Commit to building a quality project.** Research other projects built around the country. Visit them or their websites (see Appendix E).
- **Hire a competent consultant team** that understands the principles and practices of Great American Neighborhood design.
- **Understand the site.** Identify areas that should not be disturbed (e.g., wetlands and stream corridors) as well as those features that give the land character (old trees, stone walls). Have the design team prepare a site analysis to explain the site opportunities and constraints.
- **Engage the community early on**, even before pencil has been put to paper. Get to know the neighbors. Understand their hopes and fears.
- **Hire a professional facilitator** if you are not comfortable dealing with the public, preferably someone with experience in housing and community development.
- **Sponsor informational sessions** for the larger community to explain the principles of Great American Neighborhood planning. Show them examples – preferably from Maine – of the type of community that you want to build. Discuss what the alternatives are, and what effect they would have on the environment, livability, open space, etc.
- **Hold design workshops** with the community. Provide them with meaningful opportunities to review and/or contribute to the design process.
- **Go back to the community** with preliminary sketches before formally presenting them to the town. The object is to make sure your design team got it right. Make sure they understand how the project will benefit them and the entire community.
- **Start with freehand plans** when discussing the project with the planning board, municipal officials, and state regulators. There is no point spending money on engineering before the concept has been endorsed.
- **Get early input from the regulators.** Talk with the planning board, planner, code officer, municipal engineer, fire and police chief, DEP, Corps of Engineers, and others. Ask for scoping sessions to identify key issues and expected approaches to deal with them.
- **Keep the neighbors up to date.** Keep them informed about the plans, schedule, public meetings, and any changes that are made.



### MAKE SURE THE MATH WORKS!

*Infrastructure costs associated with Great American Neighborhoods are often considerably higher than conventional subdivisions. The added costs of curbs, sidewalks, alleys, utilities, streetscaping, and other amenities require that the density, and the consequent sales prices, cover project costs. This is critical or the project won't get off the ground!*

*Higher density can be achieved by creating smaller lots and/or incorporating a mix of housing types. Some commercial development can also help offset higher development costs. This will require a site where zoning permits the density and uses required to make the project financially viable. If the land is not properly zoned, you will need assurances that it can be rezoned – within a reasonable time frame – to a higher density.*



## EXAMPLES OF PROJECTS

While every project is different, most Great American Neighborhood developments exhibit common characteristics. These examples are based on real world projects. They show that a Great American Neighborhood can take many forms and fit diverse sites. The underlying principles that shape them, however, endure.

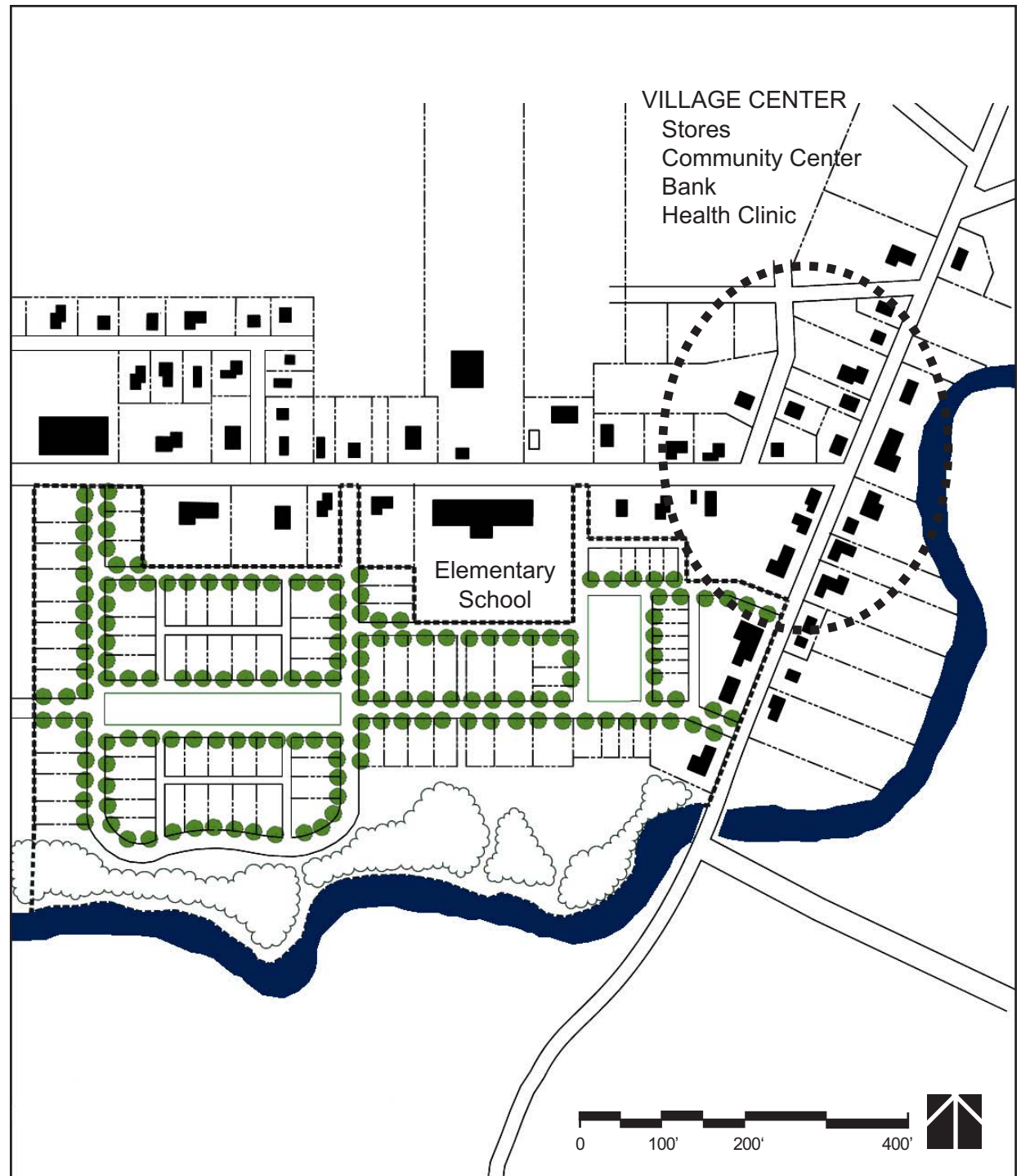
### PROSPERITY VILLAGE A Village Fringe Site

This sketch plan for a 50-acre site near the village center capitalizes on existing community assets – the school, local stores, and town sewer and water systems. The plan complements existing roads and residences, and incorporates new commercial buildings on the north-south arterial road.

This example demonstrates that small village centers can be enhanced and reenergized by building a variety of new housing near the village center. It's good for the village businesses, too.

#### SITE SNAPSHOT

- Overall site: 50 acres
- Infrastructure: Town sewer/water available; public roads; private alleys
- Program: 50 single family homes  
13 duplexes  
22 townhouses  
3 commercial buildings  
park/green/open space
- Density: 3.0 du/gross acre  
5.0± du/net acre







**SAFE STREET DESIGN**

## GREAT AMERICAN NEIGHBORHOOD PLANNING PRINCIPLES

These diagrams show how four Great American Neighborhood planning principles have been applied to Prosperity Village. They are: 1) design safe streets, 2) provide facilities for pedestrians and bicyclists, 3) include a mix of open spaces, and 4) link the project to the community.

### Safe Street Design

- discontinuous grid of internal streets
- connections to surrounding streets
- short cuts discouraged
- narrow streets with on street parking
- service drives for back yard parking
- hierarchy of street types



**OPEN SPACE AND RECREATION**



**PEDESTRIAN AND BICYCLE FACILITIES**

### Pedestrian and Bicycle Facilities

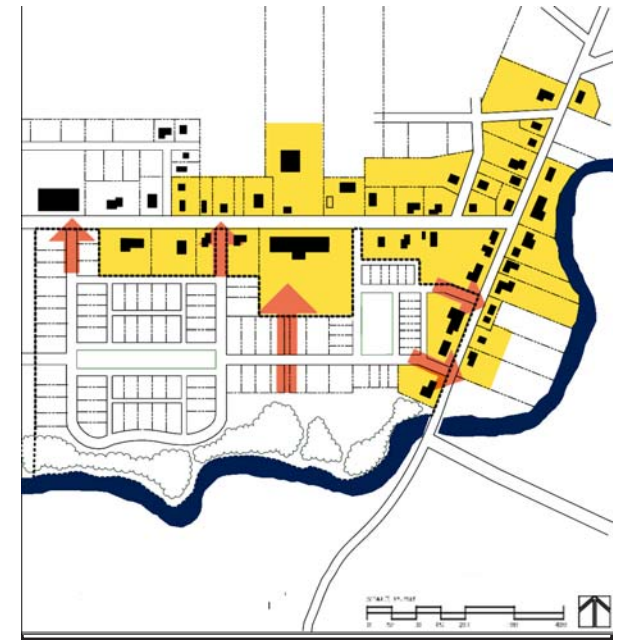
- sidewalks on both sides of new streets that link to existing sidewalks
- a multipurpose trail near the stream
- a pathway connection to the school

### Open Space and Recreation

- central formal park/play area defined by right-of-way
- a common green
- a streamside natural area
- tree lined streets

### Community Connections

- walkable distance to school and clinic
- stores on Main Street
- compactness and a mix of lot sizes
- access to a bus stop on Main Street
- mix of land uses and housing types, typical of the village



**COMMUNITY CONNECTIONS**

## BROADVIEW

### A Suburban Infill Neighborhood

By consolidating several adjacent lots to form one large 45-acre parcel, the developer was able to enlarge an existing traditional neighborhood and provide needed open space.

The typical blocks consist of single family homes and town houses served by alleys. Existing streets extend into the new neighborhood, which is compatible with existing homes.

Downtown stores and services are only a five minute walk from the new neighborhood. The design features a formal neighborhood park with a community center and linkages to a multipurpose riverfront trail.

#### SITE SNAPSHOT

- Overall site: 45 acre
- Infrastructure: Town sewer/water;  
public roads;  
private alleys
- Program: 63 single family homes  
26 townhouses  
community center  
two parks
- Density: 2.0 du/gross acre  
4.0± du/net acre





## WOODACRES

### A Small, Village Fringe Site Comparing Options

The developer of this 15-acre tract, within easy walking distance of the village, explored two approaches. While the existing zoning allowed a conventional subdivision, a new section of the ordinance encourages a village style land use pattern as an alternative.

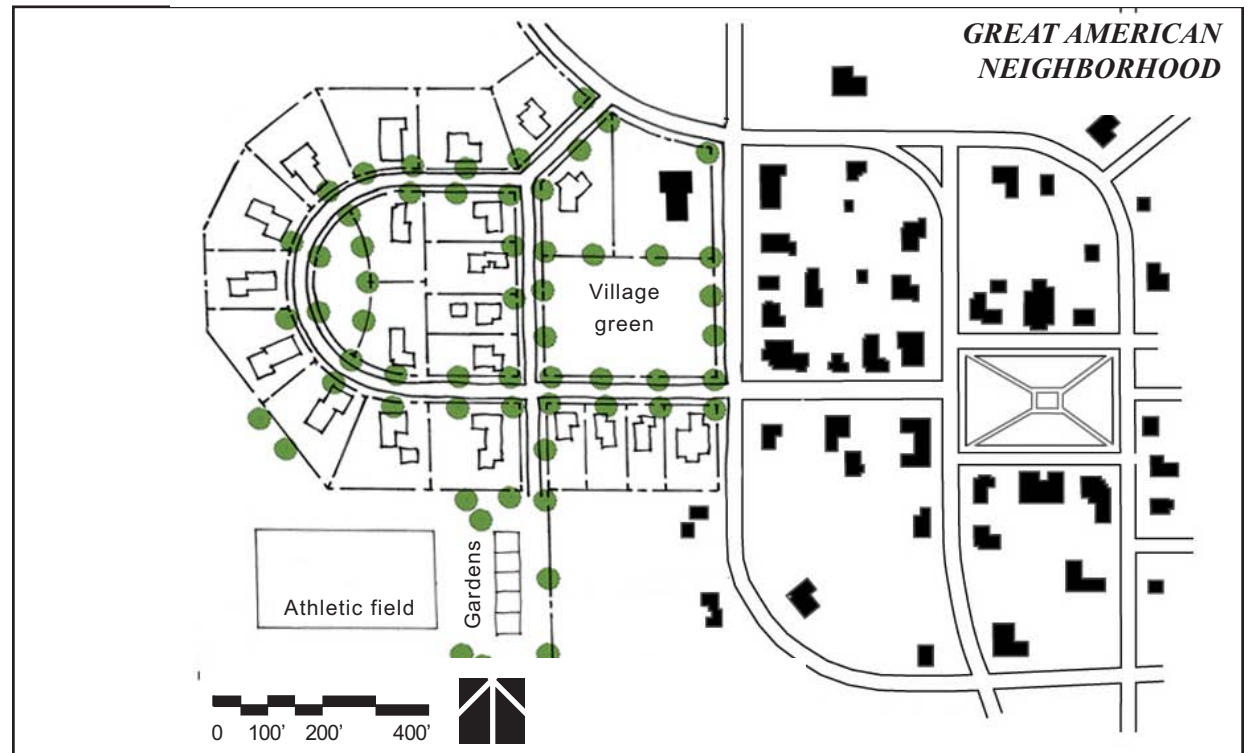
#### Conventional Subdivision Plan

- 19 lots, no common open space.
- Cul-de-sac roads.
- Less efficient plowing and school bus routes.
- Planning Board has waived sidewalk requirement, making it difficult to walk to village.
- Homes are set back from the road, with large front lawns.
- No linkage with adjacent streets.

#### Great American Neighborhood Plan

- 22 lots, village green, athletic field, community gardens, and trails.
- Follows the established village street pattern, with two points of access and sidewalks.
- Additional lots help offset slightly higher infrastructure and amenity costs.
- Achieves more usable open space.
- Follows traditional village development pattern, with narrow lots, and homes close to the road.
- Street trees, sidewalks, and homes create a pedestrian streetscape.

Clearly a Great American Neighborhood approach is more desirable because it maintains the scale and traditional character of the village while providing common open space and additional lots.





## INGRAHAM CORNER A New Growth Area Site

As part of its Comprehensive Plan, Rockport designated 200+ acres of land near the historical crossroads of West Rockport as a growth area. The plan for Ingraham Corner resulted from an intense design forum involving many members of the community.

The plan calls for a mixture of single family homes and a small commercial core with shops and offices, plus land set aside for civic uses such as a post office, branch library, and elementary school. The road layout emphasizes a series of prominent hills that will give the neighborhood a unique identity. Wetlands and an intermittent stream have been protected by a significant buffer zone. Small greens and common areas are located throughout. The plan will take advantage of public utilities to be extended to the site.

### SITE SNAPSHOT

- Overall site: 120 acres
- Infrastructure: Town sewer/water; public streets; private alleys
- Program: 190 single family homes  
shops/offices/library/post office  
community center/day care  
parks/greens
- Density 2.0 du/gross acre  
3.0 du/net acre





## PIKETOWN

### A Village Fringe Project

Several undeveloped properties had to be assembled to create this 150-acre parcel on the fringe of an older village. The program calls for a new community of 400 units in a mix of single family homes, condominiums, apartments, and senior housing.

The interior road layout, with its curvilinear streets, short blocks, and frequent turns, was designed to discourage cut through traffic. Private alleys provide access to rear garages, minimizing the number of driveways that interrupt the side-walks.

The open space system includes community parks, wetland buffers, a town green, off road pathways, and sidewalks with esplanades throughout.

#### SITE SNAPSHOT

- Overall site: 150 acres
- Infrastructure: Town sewer/water available; public roads; private alleys
- Program:
  - 120 single family homes
  - 120 condominiums
  - 120 studio apartments
  - 80 senior housing units
  - 25,000 SF village commercial
  - community center
  - parks/greens/open space
- Density:
  - 3.0 du/gross acre
  - 6.0 du/net acre



## PROJECT PLANNING CHECKLIST

In many respects, the planning process for a Great American Neighborhood is similar to that of a conventional subdivision. Once the site is selected, the design team evaluates the land, structures a program, and develops preliminary designs to test the project's viability. The project is then subject to a formal review and approval process.

However, there are significant differences. Rather than setting houses on lots, a whole neighborhood is being shaped. The quality of the end product is a function of how successfully the planning process considers the details. Further, there may be unusual zoning issues to contend with. Increased density may have implications for stormwater, traffic, and visual impacts. Community resistance to change must be addressed.

## PROJECT CHECKLIST

The following checklist will help you identify some of the key planning and design process issues.

### Determine Target Market(s)

- Rely on gut feeling and/or market research
- Refer to the State Planning Office's report 'Markets for Traditional Neighborhoods'

### Organizing Principles

- Big picture: define image of the neighborhood
- Ensure human scale
- Integrate open space throughout
- Achieve privacy
- Make connections with the community
- Define boundaries: natural/built
- Bring nature into the design
- Create entrances

### Road Network

- Determine access points and street hierarchy
- Discourage cut through traffic patterns
- Establish right-of-way and street widths
- Allow on street parking
- Consider alleys/service drives

### Pedestrian/Bicycle System

- Connect to neighborhood facilities
- Determine the location and widths of sidewalks
- Consider on road bicycle lanes
- Plan for multipurpose pathways

### Single Family Homes

- Number/types      ○ Compact, variable lot sizes
- Determine optimum number of homes/block

### Multifamily Homes

- Integrate into neighborhood
- Determine mix of housing types

### Other Housing

- Garage apartments      ○ Upper floor apartments
- Affordable housing      ○ Age restricted housing

### Commercial Development

- Study/analyze the market
- Optimize size, location, and composition
- Be a good neighbor to adjacent residences

### Community Facilities

- Types of uses: day care, educational, institutional, commercial, mixed

### Open Space System

- Formal Spaces: village commons and greens, shade trees along sidewalks, incidental spaces
- Recreation Areas: fields, courts, playgrounds, picnic areas
- Natural Areas: wildlife habitat, wetland buffers, trail corridors

### Stormwater Management

- Establish general concepts
- Centralized v. decentralized facilities
- Minimize impacts on downstream properties

### Utilities

- Underground, partially buried, overhead wires
- Public sewer: capacity, location
- On site septic or community septic
- Community water or public utility

### Design Details

- Streets/sidewalks      ○ Landscaping
- Lighting      ○ Play equipment
- Mailboxes      ○ Graphics/signage
- Fencing      ○ Benches

### Organizational Issues

- Public v. private roads, or a mixture
- Ownership and use of recreation facilities
- Ownership and use of open spaces
- Need for homeowner's association

### Miscellaneous

- Phasing priorities      ○ Impact fees
- Fallback positions      ○ Project / street names
- Coordinate designers/contractors

## A NOTE OF CAUTION

While all of these items are important, you do not have to explore them in great depth initially. Test the financial feasibility of your proposal early on, once a sketch plan is in place, before engineering is started. Only when you are comfortable that your development costs and profits can be covered by sales should you proceed.

Your sketch plan should show lot sizes and unit types and allow you to determine infrastructure and site prep costs, fees, and likely sales prices.



## OPEN SPACE AND CIVIC AMENITIES

### Open Space System

The open space in a Great American Neighborhood is an important structural framework that gives it form, identity, and a connection with nature.

The design of the open space system starts during the site analysis by identifying key natural and cultural features which define the character of the land. These can include landmark trees which can become focal points in a town green or existing trails which can provide connections between neighborhoods.

Open space is not the leftover or unusable part of the site. It is part of a consciously designed system that knits together circulation systems, gathering places, recreation amenities, quiet rest areas, and places that soothe the soul. It is the part of neighborhood design that provides for refreshment, recreation, and health of the residents in addition to privacy within their own property. In short, it is the ready accessibility of open space that makes a compact neighborhood livable.

Public amenities should be located within a five minute walk of most homes. They may be provided on or off site by the town or developer, or through community collaboration. Market research shows that buyers seek neighborhoods that are close to amenities, such as meeting places, common green, a church or civic building, post office, elementary school, or combination of such elements.



*In this traditional village setting, the local school provides recreational open space within an easy walking distance.*

- The area set aside for amenities should be proportionate to the size of the neighborhood. A 100-acre neighborhood might have a core of civic amenities located on 1 to 4+ acres.
- Most neighborhoods should have three distinct types of open space: **formal spaces** that are often geometric and fronted by buildings, (esplanades, parks, village greens); **recreation areas** (play fields, basketball and tennis courts, playgrounds, community gardens, picnic areas), and **natural areas** whose primary function is protection of a natural feature (trail corridors; buffers around wetlands, streams, highways, and incompatible adjacent land uses). An open space may be multipurpose. A range of facilities should be provided for all ages.
- For large and small projects, a substantial portion of the space should be dedicated to nonprogrammed, passive, green space.

- Whether amenities are on or off site, they should be easily accessible to all residents by road, sidewalk, and, when appropriate, off road pathway. Open spaces should serve as focal points, either by design of the elements or their placement in the neighborhood. They should frame or shape views.

It may not be necessary to make definitive design/programming decisions about common facilities. For example, a large open field might be dedicated to the municipality as part of the open space system, with the understanding that it might be used as a community center, park, or fire station at some point in the future.

At a minimum, all Great American Neighborhoods should have informal gathering places: street corners, benches along pathways, and small plots of undeveloped land that the neighborhood can personalize.



*The open fields and woods surrounding this village have been protected to preserve their open space values.*



*Existing trees were inventoried during the initial planning phase and incorporated into the open space plan.*

If a small project is planned as part of a larger neighborhood, amenities may be built in a later phase or under different ownership. The project plan, however, should ensure that access to the amenities is provided and that everyone feels a sense of ownership in them.

Open space may ultimately be deeded to the community as public land or retained by a homeowners association. Developers should be prepared to discuss the pros and cons of each alternative with municipal officials when locating and designing open space.

If the project is an infill development, it may provide an internal courtyard or open space. It may also take advantage of existing open spaces and recreational facilities in the surrounding neighborhood.

## Open Space Guidelines

The open space system should be an integral part of the design for the neighborhood. There should be a perceived flow of open space, both internally and where the plan ties into existing, adjacent features.

Specific standards for open space are difficult to prescribe given the range of residential densities and neighborhood sizes addressed here – especially when adjacent schools or other public spaces may be available. Nevertheless, ensure that open space is available for all age groups, within easy walking distance, on or off site. In general:

- Provide some type of open space within 300 to 500 feet of every home, especially those designed for seniors and families with young children. Provide benches, landscaping, and play equipment. This may be less critical in neighborhoods with generous lot sizes or where the site is adjacent to existing parks.



*A neighborhood green is an important part of this community's open space system.*



*This new neighborhood has a half acre park as its focal point, providing a place for socializing and play.*

- If no school play areas are within 1/2 mile or so, provide space for 6-12 year olds for pickup games, basketball, informal soccer, etc. A minimum of 1/2 acre (approximately 100' x 200') is recommended. Fields can often serve the additional purpose of a community green or gathering place.
- Construct shaded sidewalks throughout the neighborhood. Where appropriate, provide trails for off road walking, bicycling and jogging. Coordinate plans with your environmental consultants to minimize impacts on wetlands and wildlife corridors.
- Look for opportunities to provide interconnections with adjacent open space and trail systems. Coordinate your open space plans with local officials from the outset.
- Important natural features should be a key component in the open space system. Storm-water management may be incorporated into the open space design by filtering runoff through vegetated swales, settling ponds, and created wetlands.





*This lake is a major component of the stormwater management system and the community's focal point.*

- Use scenic vistas as focal points in the design of the open space system. Vistas might include dramatic features such as unobstructed views of significant topography, water bodies, or distant mountains. But they may be as simple as a small rock outcropping or an attractive stand of mature trees.
- Some new neighborhoods warrant a tasteful gateway announcing an 'entrance' to the neighborhood with simple signage, stone or wood structures, and landscaping. However, since most of the older neighborhoods in Maine are not marked in any way, it may be appropriate to have no special signage, and simply extend the street and open space patterns that are already present.
- Along with the conscious design of the open space system and layout of lots, odd shaped leftover spaces are sometimes created. Areas such as these can provide opportunities for small sitting areas, community gardens, or vest pocket parks that add personality and interest to the neighborhood.
- In communities that are concerned about preserving open space, where current zoning does not allow the density needed to support the project and where contract zoning is an option, consider making a contribution to a fund to buy undeveloped land for permanent conservation elsewhere in the community in exchange for an increase in allowable density.

The community can use these funds to match local dollars and/or leverage additional state and private dollars to multiply its purchasing power to preserve open space. Not only can such a strategy help the community with its open space goals, but it could help divert growth from rural or undeveloped areas of the community and avoid the impacts of development, including traffic, in these areas.



*Informal sitting areas, providing places for chance meetings, are common throughout the neighborhood.*



*An extensive trail network runs behind homes, connecting neighborhoods, the school, and community gardens.*



## MIXED USE NEIGHBORHOODS

Homebuyers who fit a Great American Neighborhood profile (see page 4) often seek out places that offer a healthy mix of people and land uses. They are looking for socially dynamic, public and private places that offer a range of compatible uses, within or close to their neighborhood.

These neighborhoods may include a variety of housing types, stores, services, offices, health clinics, gyms, and places of entertainment. Your ability to provide some or all these service may be limited by market, zoning, or size of the surrounding community. However, there may be substantial benefits to a mixed use approach, especially if two or three story structures can be marketed with stores below and offices and/or residences above.

- Consider a mix of housing types and prices. Higher density housing may include duplexes, townhouses, patio homes, low rise multifamily apartments, studio apartments, carriage houses, granny flats, and live-work units.
- Encourage day and night activity and socializing by building housing units over commercial buildings – making sure these areas are designed to be good neighbors to any nearby single family homes.

*‘Rather than argue for concentration of people, we identify the small things...that draw people together into denser settlements and make the mix and mingle a pleasure rather than a dose of liver oil.’*

David Sucher, *City Comforts: How to Build an Urban Village* (1995). [www.citycomfort.com](http://www.citycomfort.com)

- Seek sites near places that already have mixed use activity. An urban or village infill site located next to an arterial street with stores, offices and other mixed uses already on it, might be ideal, provided the plan allows for easy access and there is a sense of belonging and connection between what exists and what is proposed.



*Small shops on the ground floor with apartments above.*

In some cases, commercial uses may not be allowed or appropriate in the neighborhood. It may still be desirable to integrate duplexes, carriage houses, granny flats and over-the-garage apartments among single family homes. Not only will this increase the overall density of the neighborhood, but it will provide for a mix of housing sizes, incomes, and life stages of resi-

dents as well as variety in the streetscape. It will better accommodate singles, childless couples, young families, empty nesters, and elderly and provide the opportunity for a diverse and multi-generational group of residents.



*Live-work units where owners live on the top floor, lease the second floor, and have offices or shops on the street level.*



*Apartments over garages are an efficient way to incorporate affordable housing into a neighborhood.*



## PARKING AREA DESIGN

People react negatively to expanses of paving in large parking lots. They are ugly, hot, and create problems with stormwater pollution. They are also a fact of life in modern-day America, especially in areas with apartments and commercial buildings.

Parking lots for multifamily housing or commercial/institutional uses should be limited in overall size and carefully sited and designed so they are not visually intrusive.

Parking lots should be designed according to the following general guidelines:

- Locate lots in back of buildings (or to the side) but not between the street and the building.



*Shade trees and landscaping create an attractive parking area for cars and bicycles.*



*Trees and shrubs on a low mound effectively screen this parking area from the public road.*

- Buffer parking lots with generous landscaping, low fences, walls, and/or earth berms.
- For every 20 parking spaces, provide at least one shade tree in an island within the lot.
- Include well marked sidewalks to ensure safe access to and from the lot.
- Provide places for bicycle parking in safe, high visibility locations.
- Use cutoff light fixtures that provide minimal amount of lighting necessary for safety without causing glare or light pollution.
- Break up large lots into smaller components with trees, landscaping, or buildings.

*‘...parking lots are crucial but taming them will be one of the crucial parts of piecing together urban villages.’*

**David Sucher, *City Comforts: How to Build an Urban Village* (1995). [www.citycomfort.com](http://www.citycomfort.com)**

## WINTER MAINTENANCE

Winter poses a significant challenge to both pedestrian and vehicular movement in Maine. Planning for the inevitable snowstorm must be factored in to all phases of the design.

- Consider where snow will be stored after it has been removed from roads and parking areas. Many communities require that snow storage areas be shown on the site plan.
- Avoid placing fencing, walls, mail boxes, and delicate plantings too close to the sidewalk where they could be damaged by snow removal equipment.
- Site tree islands in parking lots with consideration for snow removal.
- In snow storage areas, select plantings that can withstand the weight of a winter’s accumulation of snow and ice.
- Early in the design process coordinate the road layout with the public works director to assure that snow removal concerns are being met.



*Wide esplanades are especially valuable in the winter as a place to store snow from both plows and snowblowers.*



## IV. GRID, BLOCK, AND STREET DESIGN

### STREET PLANNING FOR LIVABLE NEIGHBORHOODS

Since the earliest human settlements, the street has been the essential building block of our communities. The street network and the open space system are the two primary factors that give form to a Great American Neighborhood.

There is a recurring pattern of streets and blocks of residential lots that is common to practically all great neighborhoods. Invariably a grid pattern of streets characterize our villages, towns, and cities. The grid may be ‘dense’ in urban areas – comprising regular or irregular blocks – and somewhat more spread out in smaller communities.

Indeed, the street pattern, the open space system, and the sites’ physical features give the designer an opportunity for creativity and placemaking. There are several basic design principles in laying out streets and blocks.

#### Provide a Hierarchy of Streets

To maximize access and enhance connectivity, provide a hierarchy of streets. In large projects this will include wider connectors and somewhat narrower residential streets. In smaller projects, it may mean a variety of local streets and even narrower service drives.

#### Plan for Connectivity

New streets should be interconnected and linked to existing neighborhood streets wherever pos-



*A central landscaped island is a graceful way to split traffic and add scale to the neighborhood.*



*A sharp turn at the end of the street forces people to slow down as they enter the main street.*

sible. All residents should have at least two direct ways to get to and from their homes by car. Properly located and designed, a connected network can also discourage through traffic looking for a shortcut while providing interest and variety to the streetscape.



*A 24' wide road allows room for on street parking and a channel for through traffic.*

Avoid dead-end streets and cul-de-sacs, except where dictated by topography or wetlands. Even then, seek alternative connections even if it requires a modification of the grid pattern. As alternatives to conventional cul-de-sacs, consider the use of ‘eyebrows’ or U-shaped streets, such as those illustrated on page 29. These can add interest to the street and value while providing additional privacy.

#### Create Short Blocks

The block length in most new neighborhoods should vary in response to site features and concept. In general lengths should not exceed 400-600 feet to keep speed down and maintain the quality of the neighborhood. Six to eight homes on each side of the street is optimal for a neighborhood of single family homes. The design of longer blocks should consider mid-block pedestrian paths.



*Overly wide roadways encourage speeding and detract from the scale of the neighborhood.*



*The esplanade has deteriorated to a point where curbing may be required.*

## Adjust the Road Alignment

Minimize straight-shot streets that encourage speeding. Introduce angles, curves, and ‘T’ intersections as part of the overall pattern to reflect the topography of the site, create focal points, and preserve noteworthy features. Tight curves also help slow down traffic. Be careful not to unreasonably increase walking distances to primary destinations.



*An island splits the traffic flow, creating a mini-park and giving the church a more civic presence.*

## Provide Focal Points

Use focal points, landmarks, prominent structures, and landscape features to terminate or enhance views. Focal points can be an important way to create an identity for the new neighborhood and assist in wayfinding.

## Use Special Corner Treatments

Corners in new neighborhoods should be designed with the pedestrian in mind. Tight corners with minimal curb radii will provide the shortest crossing distance and require traffic to slow down when making the turn. On larger streets, especially in commercial areas, neckdowns can be used to reinforce crosswalks at corners.

## Plan for Bicycles

Provide safe facilities for bicyclists throughout the neighborhood. Most residential streets have

low traffic volumes and bicyclists can be accommodated within the roadway. On higher volume streets, paved shoulders or designated bike lanes may be necessary. Separate routes for less experienced bicyclists should be considered as well. Sidewalks are generally not suitable for bicycles, except for those ridden by small children.

## Allow On Street Parking

Provide space for on street residential parking on one or both sides of the road. Cars parked along the road will provide a buffer for pedestrians and discourage high speed traffic through the neighborhood. An ample supply of on street parking will justify reductions in parking requirements for certain types of community uses, such as municipal facilities and churches.

In some communities, on street parking is not allowed or is not practical during the winter to facilitate snow removal. In these situations, since space is also provided for off street parking, the streets themselves can be narrower.

## Avoid Traffic Calming Devices

The planning of the neighborhood, with short blocks, adequate landscaping, and on street parking, should be adequate to prevent high speed traffic. The road network should also be designed to discourage cut-through traffic. Additional measures to calm traffic – such as roundabouts and raised crosswalks – should not be necessary on interior residential streets.



## STREET PATTERNS: VARIATIONS ON THE GRID



### The Grid

The grid forms the basis for many existing as well as new neighborhoods being built. It provides the maximum amount of connectivity and is very easy to navigate. Variations within the grid structure can add visual interest while discouraging cut-through traffic. The pure grid is most suitable for relatively flat land (less than 6% slope) with few distinguishing natural or cultural features.

There are a few caveats however. The 'ideal' site is almost impossible to find in Maine. Wetlands, rock outcrops, old groves of trees, and other environmental factors will require adjustments to the grid. Further, traffic speed can increase if the blocks are too long.



### Adapted Grid

The adapted grid adds more variety to the street hierarchy: 'T' intersections, jogs in the alignment, 'U'-shaped streets (closes) can be provided. The adapted grid network is designed to slow traffic and reduce the length of individual blocks. Physical features identified in the site analysis can more easily be preserved.

The adapted grid, however, can be difficult to understand on the ground and easy to get lost in. Variety within the road system needs to be balanced by an underlying sense of order.

Any grid layout should be efficient. Try to minimize the length and extent of streets so construction is reasonable and cost effective.



### Curvilinear Grid

With this approach, the basic form of the neighborhood is guided by natural features – streams, wetlands, edges of old fields, etc. – that are to be preserved and incorporated into the overall plan.

With the plan shown above:

- The outer ring road is often the busiest. The street, and lots along it, may be larger and the homes set back farther from the street.
- Neighborhoods can effectively combine straight and curvilinear roads. In this case, the straight roads connect open spaces.

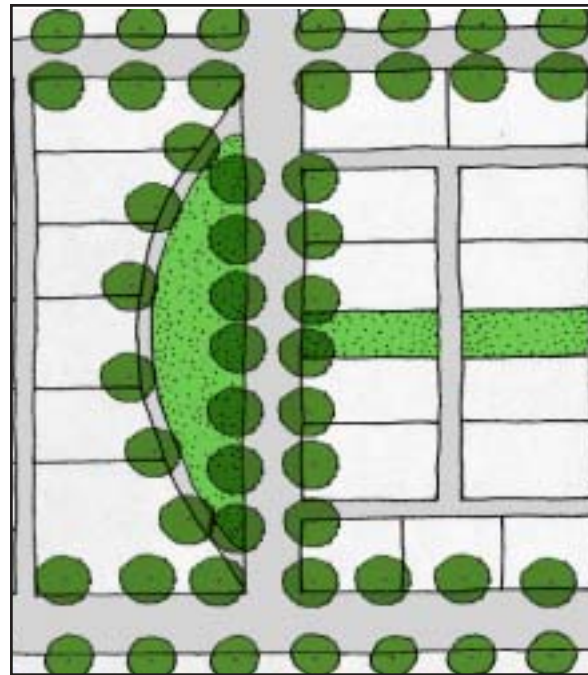
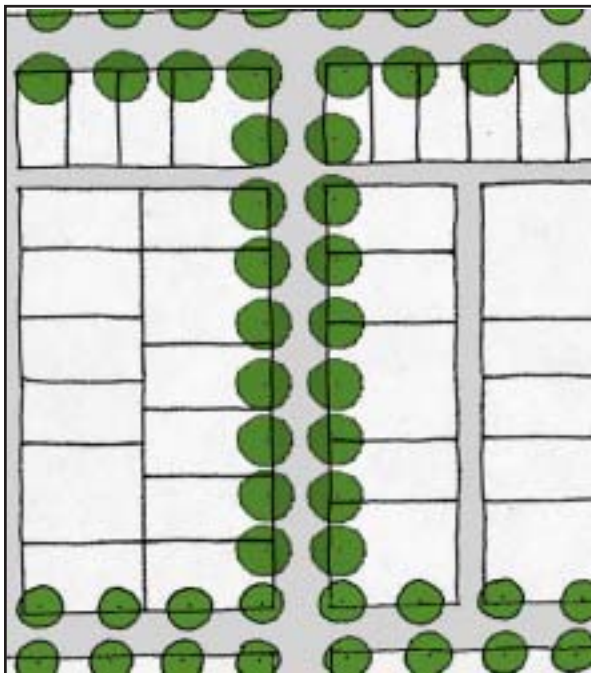


## SOME VARIATIONS ON BLOCK PATTERNS

Whether they are rectilinear, curved, or irregular in shape, blocks should be designed to accommodate a variety of open spaces, lot sizes, and mixed uses. They should also facilitate pedestrian movement, as the following examples illustrate.

### Traditional Block Approach

The rectilinear grid found in many Maine communities results in short, walkable blocks, a variety of lot sizes, and human-scaled neighborhoods. This approach may not work well in areas of steep topography, or where there are significant natural features worthy of protection. The block length should be limited to eight homes to prevent excessive speed. Alleys can provide access to garages at the rear. Larger lots are often found on the corners.



### Adding Green to the Block

With some creativity, small parks and greens can add value and visual interest to the streetscape. Mid-block greenways or vest-pocket parks can offer a delightful alternative to sidewalks and provide additional opportunities for chance meetings. This approach can be extended throughout the neighborhood to establish a pedestrian greenbelt.

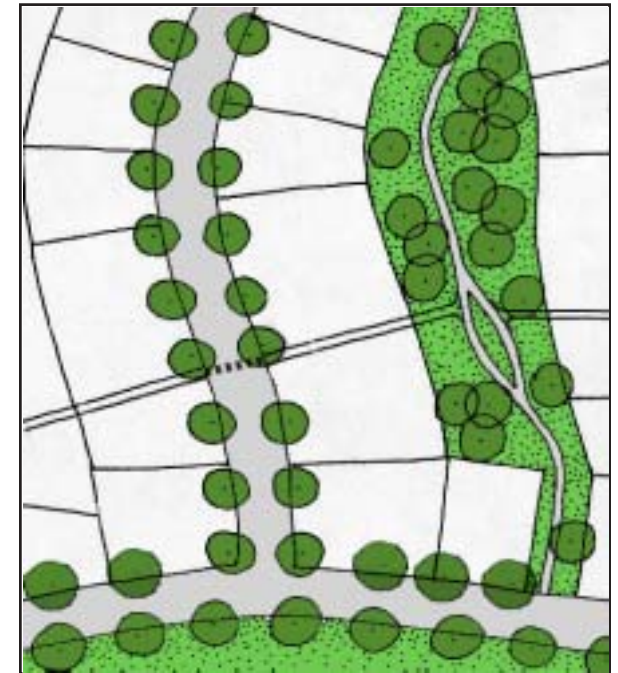
*'A journey seems quicker, livelier and more eventful when punctuated by crossing streets..'*

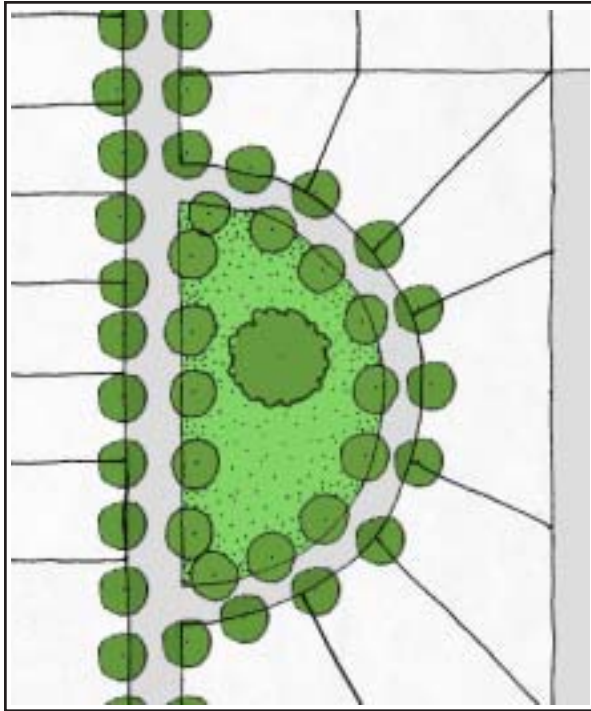
David Sucher, *City Comforts: How to Build an Urban Village* (1995). [www.citycomfort.com](http://www.citycomfort.com)

## Preserving Natural Features

The layout of this road follows the open space network and preserves a line of older sugar maples on the property. An informal trail runs through the wooded open space behind the homes.

Single family homes are located close to the curving street. Mid-block connections facilitate access to the open space. Larger lots on the corner are designed to accommodate two-story homes or apartments, while providing a visual anchor for the block.





### A Green Eyebrow

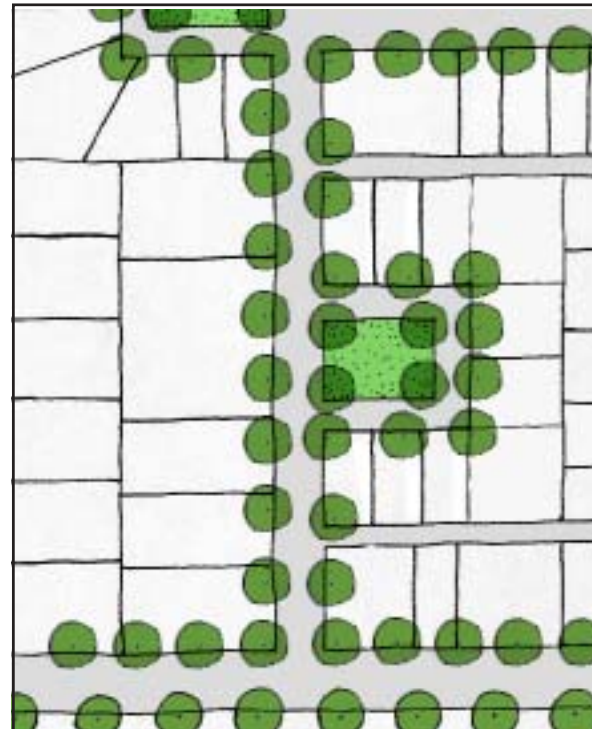
Eyebrows – short, semicircular roads – can be used effectively to provide a bit more privacy on the block, while still maintaining a sense of community. The central green space can be used to preserve significant site features – such as a stand of outstanding trees – and act as a focal point for residents. Lots facing the eyebrow can vary in width to add greater variety to the neighborhood. Eyebrow roads can be one-way, and hence, narrower.

### A Mixture of Road Types

Streets should be designed to meet the needs of pedestrians, bicyclists, and vehicles in the neighborhood.

In this example there is an opportunity for a broad variety of lot sizes and housing types: townhomes with access off alleys; rowhouses facing a central green; single family homes on a short minor road; and duplex units on the corners.

There is also the opportunity to vary the size of single family lots on an individual street by allowing lots to be combined for greater width. This reflects an older pattern when lots were 3,000 to 5,000 SF and people could buy single, double, triple, or quadruple lots and combine them.



### Radial Roads

Civic buildings, natural features, and other points of interest set in common greens, provide focal points for the local roads in this example. The road network responds to the hilly topography, resulting in some relatively short road segments.



## SAFETY AND STREET DESIGN

Streets in livable neighborhoods should be designed to accommodate pedestrians and bicyclists while allowing traffic to move at a reasonable, safe speed.

### Traffic Safety

Roadways shape the form of the neighborhood as well as the lives of those who live in it. Roads can be both barriers and connectors. Once traffic volumes on a street reach about 2-3,000 vehicles per day (approximately 200-300 vehicles at the peak hour or 4-5 cars per minute), the traffic tends to divide a residential neighborhood. Commercial uses, however, are best located on streets with higher traffic volumes where they can serve as neighborhood meeting places.

At volumes of 5,000 vehicles/day, neighborhood cohesion starts to break down. Keep in mind that quiet residential streets should carry no more than 2,000 vehicles per day.

### Traffic Noise

Traffic noise at or less than 55 decibels (dB) outside a home is generally acceptable to neighborhood residents. At 65 dB (twice as loud as 55 dB), people find that the noise becomes bothersome. They will complain that they cannot have a conversation, watch TV, or engage in social activities. When vehicles travel in excess of 35 mph, noise levels can exceed 70-80 dB. The most realistic way to deal with such nuisance level noise is to put distance between the source and the listener, although dense planting, solid fences and earth berms can help. But the best approach is prevention: design the streets to discourage high volumes and speeds in the first place.

### Implications for Neighborhood Development

To be livable, neighborhood streets should be designed to discourage high speed, high volume traffic.

- Commuter or through traffic should be discouraged by the design of the street network.
- High volume roadways should be located in areas where the noise will be attenuated by distance, and/or the abutting land uses will not be adversely affected by the noise.
- Boulevards, parkways, and collector roads designed to carry higher volumes of traffic should be designed with a substantial amount of landscaping to screen the view and noise of the vehicles.
- Road networks should be laid out with the assistance of a traffic engineer experienced in traditional neighborhood traffic patterns. Residential streets should be designed for maximum speeds of 15-25 mph, while allowing for snow plows and the occasional emergency vehicle, delivery truck, or moving van.
- Where collector roads are needed, they should be designed for speeds not to exceed 30 mph.



*Roadways should be designed to discourage high speed, high volume traffic through careful arrangement of cross streets, location of buildings, and proper attention to landscaping.*



## Street Types and Widths

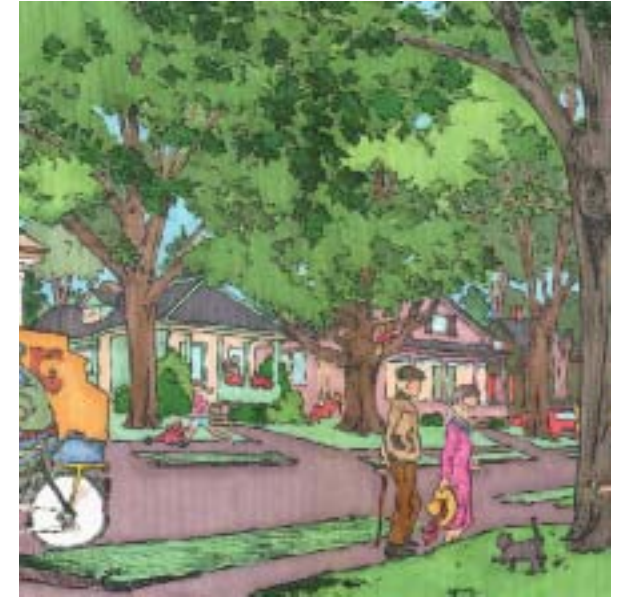
A variety of street types are often appropriate in a Great American Neighborhood. The final design should result from an understanding of the intended speed, anticipated traffic volume, and the desired street character. The street layout must also respond to topographic conditions and drainage patterns to fit into the landscape.

Streets should be considered part of the neighborhood transportation network that also includes sidewalks, walking paths, and bicycle lanes.

The table below provides recommended standards, based on time-tested examples from

older neighborhoods. Street widths are intentionally narrow to emphasize safety. At the same time, these widths are adequate for on street parking and emergency vehicles.

The right-of-way needed to accommodate the street travel ways, parking, esplanades, sidewalks, lights, and utility lines will depend on the overall street design. Fifty feet is usually sufficient for a residential street while the right-of-way needed for minor streets and alleys may be narrower.



	Width	Design Speed	Corner Radius	C/L Radius*	Curb	Block Length	Trips/Day**	Side walks***	Bike Lanes	Trees	2-Way Traffic	Parking
Alley	10-12'	10 mph	15'	50'	no	400'	200	No	No	Optional	Yes	Off alley
Minor Street	16-18'	20 mph	15'	90'	Optional	600'	200	Optional	No	Yes	Optional	1 side
Street	24-26'	25 mph	15'	90-120'	Yes	800'	600	Both	No	Yes	Yes	2 sides
Collector	Varies	30 mph	25'	250'	Yes	n/a	3-20 K	Both	Yes	Yes	Yes	Optional

\* C/L: Centerline of street

\*\* Capacity of the street in vehicle trips per day

\*\*\* Sidewalks may be optional in very low traffic volume situations, e.g., where there are only a few homes on a residential street or very limited roadway access.

Notes:

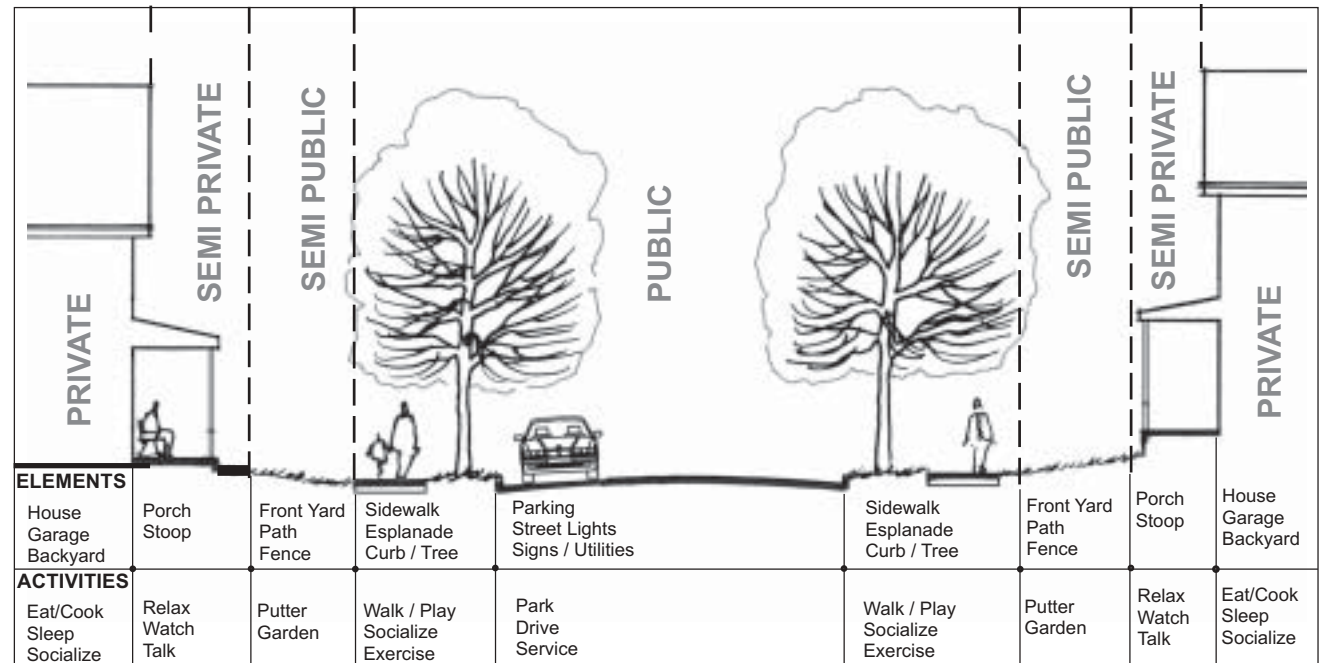
- Adopted from *Street Design Guidelines for Healthy Neighborhoods*, Dan Burden, January 1999.
- Values given are maximums.

- Final design should be prepared by professional traffic engineer.
- Some flexibility is expected, but design speeds should be adhered to.

## STREET CROSS-SECTION: The Public-Private Realm

In a conventional subdivision the street is generally regarded as a travelway, a place designed primarily for the automobile. The rest of the land within the right-of-way is used for grading, drainage structures, utilities, and occasionally a sidewalk.

In a Great American Neighborhood, the right-of-way is an important place. It's where kids play hopscotch, learn to ride a bike, and play catch. It's where neighbors meet, cars travel and park, and people exercise. It is a multipurpose, community space. Within this place are public and private realms where many neighborhood activities take place.



**Public space:** the street, sidewalk, and planted esplanade. Furnished with shade trees, mail-boxes, street lights, and street signs.



**Semi public space:** front yards and walkways. These are part of the semipublic realm where neighbors stop for an outside chat.



**Semi private space:** front porches and stoops, where residents keep an eye on the street, watch their kids play, or have a private conversation with a friend. It is an important, sheltered, welcoming place where residents interact with visitors outside the privacy of their homes.



**Private space:** inside of the house and the back yard. This is a personal refuge into which non-residents enter only when invited.



## The Scale of the Street

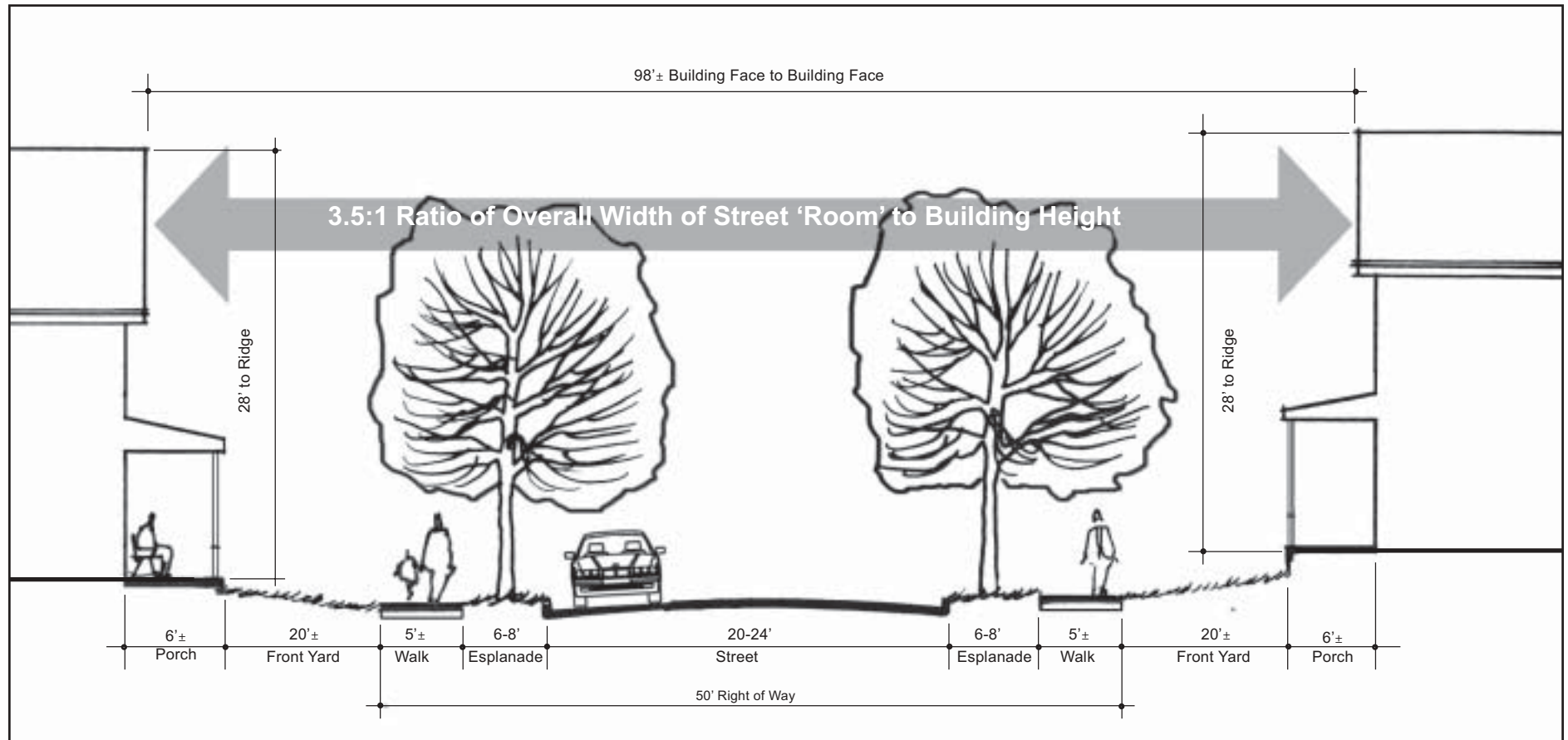
Successful streets are three-dimensional places, 'outdoor rooms' defined by the buildings that face them and furnished by the 'streetscape' within.

Studies of traditional neighborhoods show that there is an optimum ratio of the distance between homes on the opposite sides of the street and building heights. In New England villages, the homes and neighborhoods that hold their value and are most sought after, rarely have a ratio that exceeds 4:1 or 3.5:1. In village settings the ratio can be as low as 2:1; in urban areas, it can be as low as 1:1. Once houses are set farther back and

the ratio starts to exceed 4:1, streets and neighborhoods begin to lose the sense of enclosure and the sense of neighborhood is lessened.

### An Example

A typical two-story home, where the narrow end faces the street, is approximately 28 feet to the ridge. Using the 3.5:1 ratio, the distance between buildings would be 98 feet. With a 24 foot wide roadway, six foot esplanade, and a five foot sidewalk, the home would be set back 26 feet from the nearest edge of the sidewalk. The porch and front yard would be accommodated within that 26 feet.





*A very human-scaled neighborhood in a traditional village. The ratio of width to building height is 3:1 in this example.*



*Scale is also a function of road width. In this example the road has been expanded to accommodate additional traffic volume, resulting in a less humanly scaled streetscape.*



*Buildings with deep front yards, set back 30-50 feet from the road, no longer have the sense of neighborhood found in traditional village settings. The ratio of width to building height is approximately 6:1 in this example.*

Scale is determined by the relationship between buildings that define the street and the furnishings within the streetscape. Buildings set closer together, along with trees and other vertical elements, create a stronger sense of enclosed space. The examples on this page show the wide variations in human scale found in Maine's commercial and residential communities.



*In downtown commercial areas the ratio of streetscape width to building height can be 1:1. In downtown Rockland the ratio varies, but is typically 2:1 as seen here, resulting in a very comfortable pedestrian environment..*

***'Conversation between buildings, as among humans, is a poignant sign of neighborliness.'***

**David Sucher, *City Comforts: How to Build an Urban Village* (1995). [www.citycomfort.com](http://www.citycomfort.com)**



## SIDEWALKS, ESPLANADES, AND PATHWAYS

### Sidewalks

Sidewalks should be on both sides of the street in most neighborhoods. It is very important that they be continuous and interconnect with existing and planned new development. They may not be needed on very low volume streets where people share the paved surface with the occasional car.

- Widths of sidewalks can vary, depending on density of development, anticipated pedestrian and vehicular traffic, bicycle use, and opportunities for future connections. As a general rule, sidewalks should be at least five feet in width to allow two people to walk abreast.
- The choice of sidewalk materials is both an economic and aesthetic decision. Poured concrete and interlocking pavers are long-lasting and attractive, but more expensive to install. Asphalt, on the other hand, is both affordable and well suited for many situations.



*A six foot shaded esplanade complements the five foot sidewalk, creating a linear pedestrian parkway.*



*The bricks used in this restored sidewalk are in keeping with the historic context of the neighborhood.*

- Most sidewalks on relatively level ground will simply parallel the edge of the roadway. However, they can be located outside the right-of-way to save trees, avoid outcrops, work around difficult topography, or simply add variety to the streetscape. In these cases, widen the right-of-way or attach an 'access and maintenance easement' to the lot deed. In all situations, sidewalks should be planned to maintain the privacy of adjacent homeowner.
- Street corners, spaces under trees, stream and wetland crossings, trail intersections, and other special places should be treated as potential gathering points. Provide places for people to sit and relax by widening the walkway and adding benches.

*'The sidewalk is important because it channels pedestrian movements and forces people into closer proximity where they may bump into each other and act neighborly.'*

**David Sucher, *City Comforts: How to Build an Urban Village* (1995). [www.citycomfort.com](http://www.citycomfort.com)**

### Esplanades

Grass esplanades, or roadside planting strips, separate the sidewalk from the road, while providing a place to plant trees, pile snow, and locate utilities. Esplanades can provide pedestrians with an extra measure of safety; they encourage people to walk by providing protection from nearby traffic and a more pleasing experience.

- Esplanades should be at least 5' wide, although 8-10' is preferred for the long-term health of trees. With a 50' right-of-way, a 24' wide street, and two 5' sidewalks, 16' will be available for curbs and esplanades.



*A curb in this location would prevent cars from parking on the front lawn.*

- Maintenance responsibility of the esplanade should be strictly spelled out so there is no confusion. They can be maintained by a) individual homeowners, b) a homeowners' association, or c) the municipality. Though esplanades are usually part of the right-of-way, most homeowners will mow the grass, leaving tree care up to an association or the municipal parks or public works department.

- Grass may not be the best groundcover for esplanades in all situations. Daylilies, vinca, or other hardy perennials may be effective in high visibility locations, such as along entrance roads. In commercial areas with high turnover of parked cars, at bus stops, and similar situations, decorative paving can take the place of grass to create an attractive pedestrian space.

## Crosswalks

Crosswalks may not be necessary on residential streets within the neighborhood, especially if care has been taken to make the pedestrian environment as prominent as possible.



*Formal crosswalks are only required on higher volume roadways.*

- Curb ramps should be provided at all street crossings to facilitate crossing by wheelchairs, strollers, and elderly residents.
- Where traffic volumes justify crosswalks, install them where they are most useful to pedestrians and visible to motorists.

- Crosswalks can be painted with reflective paint for low volume roads, or constructed of contrasting materials (e.g., interlocking pavers designed for roadways) for higher volume situations. Use materials that are highly durable and slip resistant.

## Off-road Pathways

Where possible, plan for off-road pathways and mid-block connectors. They provide links to open space, support healthy recreation, and can connect to community facilities, other residential neighborhoods, and schools.

- Survey all existing pathways, both on and off the property, during the site evaluation. Work them into the overall plan wherever possible.
- Off-road paths may be left unpaved to minimize disruption of natural surroundings. However, any surface material should comply with the Americans with Disabilities Act.
- Minimum widths should be 3 feet for low volume situations. Optimum width may be 4-5 feet or wider, depending upon the anticipated volume and type of use.
- Security may be an issue. Provide lighting at starting points in the pathway and avoid dead ends. Provide 'escape routes' that allow path users to leave if they feel threatened.
- Privacy should be a concern in residential neighborhoods, but it can be addressed through proper siting, design detailing, fencing, and low-key signage. Homeowners and designers of land abutting future pathways need to be aware of this, and plan private spaces (both indoor and outdoor) accordingly.

- Many pathway users, especially seniors and parents with small children, will appreciate shaded rest areas every 300-500 feet, especially if there is any significant grade en route.



*To maintain privacy, this pathway is separated from the home by 15-20 feet, similar to a side yard setback.*



*An off road path, leading to the local school, was constructed as part of the new neighborhood. Stone walls and fencing help preserve a sense of privacy for surrounding homes.*



## LANDSCAPING THE STREET

Well maintained plantings help make the street attractive and safe, and add value to adjacent properties. Landscaping is also a proven marketing feature.



*Street trees should be selected for their year-round interest.*

### Street trees have great value

Trees have ecological, economical, environmental, and aesthetic value, and should be part of every streetscape. They provide shade for homes and sidewalks, help separate the roadway from the pedestrian, add human scale to the street, and bring nature into the built environment. Before you plant, however:

- Understand the growing conditions (what's there now) and their future requirements. Avoid trees that are easily damaged by ice, salt, or pollution. Native trees that are tolerant of urban growing conditions are strongly encouraged. Work with a competent landscape architect or contractor who is familiar with local conditions.

- Give trees an adequate amount of room to grow. Imagine the tree in 25 years, with roots spreading out as far as its outer branches. The more room it has, the better it will grow.
- Use trees to establish the character of the neighborhood. A list of trees for various purposes is provided in Appendix C.

### Trees can be an important traffic calming element in new neighborhoods

- Trees can reduce the apparent width of the street by creating a visual edge within the drivers' peripheral vision. Drivers will generally travel as fast as they feel comfortable – the wider the space, the faster they travel. This traffic calming effect becomes more pronounced as trees mature and create a canopy.
- Avoid planting within the corner 'sight triangle' to preserve visibility at intersections.



*With time and good maintenance, the streetscape will achieve a full canopy, creating a cool space for pedestrian activity.*



*Vertical curbing protects the trees as well as the pedestrians on the sidewalk.*

### Trees in esplanades are a very effective way to landscape the street

- Tree placement should be coordinated with project engineers and the utility companies to avoid wires (both above and below ground), water lines, sewer pipes, and gas lines.
- Vertical granite curbing is the best material to protect trees from errant snowplows and wandering cars. Cape Cod berm curbing, while less expensive, is mountable and therefore affords less protection to trees and people.

### Neighborhoods can be enriched through variety in street tree plantings

- Trees have different 'personalities' which can affect the quality of the street. Some street trees can grow twice as tall as nearby homes and provide a great, arching canopy over the street. Smaller, ornamental trees usually never grow taller than a house and are generally unsuitable as shade trees.

- Trees of similar height, texture, and form can help unify the streetscape on the same block or neighborhood.
- Most streets have room for one or two ‘accent’ trees – trees like Horsechestnuts that have unusual flowers, leaves, or forms – that can add a note of seasonal surprise or visual delight.
- Strict monoculture – the use of the same tree species in a single block – should generally be avoided. Remember the shock of losing the great canopied elms to Dutch Elm Disease.
- A list of street trees that do well in many parts of Maine is provided in Appendix C. These are suggestions to help you select trees that are both interesting and hardy. Consult with your landscape architect and local nursery in making the final decision regarding plant species. Talk with the tree warden to see if there is a list of trees specific to your community.



*A couple of well placed specimen trees, such as this horsechestnut, can add variety and drama to the street.*



*As trees mature, their shadow patterns add interest to the streetscape.*

### **Street tree maintenance is normally the responsibility of the municipality**

- Coordinate the species list with the municipality. Many towns have lists of preferred street trees, based upon years of experience.
- Not everyone is a fan of trees. Leaves, needles, and falling fruit can be messy. Sap can ooze onto cars. Roots can buckle sidewalks. It is important to select trees that are people-friendly.
- If trees are planted on private property, homeowners should understand what is expected of them, and what should not be done. A simple informational handout can explain some of the do's and don'ts of tree stewardship.



*A single tree can anchor a building to its site and help establish the bounds of semiprivate space.*



*Homeowners generally maintain the lawn in the esplanade between the sidewalk and the street.*



## DESIGN QUALITY IN THE PUBLIC REALM

### Lighting the Street

Street lighting is an important element in creating safe, inviting, pedestrian-friendly streets. Lighting is one way to achieve continuity and identity in a neighborhood that may have a variety of housing styles and building types.

Lighting may not always be desirable. Before committing to a lighting program, visit the established neighborhoods in the community at night to inventory where lighting has been used. In some situations, especially where homes are close to the sidewalk, front porch lights may be sufficient to provide adequate lighting for pedestrians.

- Install pedestrian scaled lighting within the esplanade. Light poles should be shorter than those typically installed in conventional subdivisions where the object is often to illuminate the roadway with a few tall fixtures. Light standards 10-14 feet in height and spaced accordingly will cast more light on the sidewalk and allow people to recognize faces at a comfortable distance.
- Use a full-spectrum light source, such as metal halide, that gives better color recognition at night.
- Discuss lighting options with the local power company and the municipality early in the design process. Many more attractive fixtures are available today than just a few years ago.
- Recognize that the monthly maintenance and operational costs for decorative fixtures may be substantially higher than the standard issue. Also, select energy efficient fixtures that minimize electrical consumption. These details may be significant to the municipality if they are being asked to accept the roadway and the lighting.
- Consider other lighting needs within the neighborhood. In addition to street lights, there may be a need to light common greens, trails and trailheads, community buildings, etc. All lighting should be designed with the same attention to safety, visibility, and detail as the road network.
- Coordinate the location of light poles so they do not interfere with underground utilities, mature trees, driveways, and alleys. The optimum place for underground electrical service may be on the house side of the sidewalk.
- Use the minimum standards recommended by the IESNA (Illuminating Engineering Society of North America) for residential development to achieve the optimal light levels. Specify ‘cutoff’ fixtures that direct light downward. Avoid lights that contribute to ‘skyglow.’
- Locate fixtures to prevent light spillage onto adjacent properties and into residents’ bedroom windows. Use house-side shields to prevent light from entering homes next to the fixtures.
- When possible locate wire utility lines underground (many communities require it). While more costly (especially in ledge conditions), it



*Period light fixtures add scale and a nice historic touch to these row homes in Hallowell. However, the lights are not particularly energy efficient and require a high level of maintenance.*

will result in a more attractive, easier to maintain neighborhood.

- In some situations, it may be possible to locate utility poles at the rear of the lot (e.g., in alleys, at the end of driveways, or rear property lines) as long as they can be serviced by emergency vehicles or accessed by utility companies.
- Coordinate the location of transformers with the utility companies. If possible, incorporate them into the planting or fencing plan to minimize their presence on the street.

## Street Furniture

Attractive, well-made street furnishings (e.g., benches, trash receptacles, bike racks, drinking fountains, fences, etc.) can encourage people to use outdoor spaces and take greater pride in their neighborhood. Properly designed and sited street furnishings can add considerable ‘curb appeal.’

- Select street furnishings with an eye to *functionality* (long-term maintenance, vandal resistance, availability of replacement parts) and *aesthetics* (forms, materials, and overall look for the neighborhood).
- The furnishings should be visually related to the lighting, signage, and other elements of the community through repetition of color, form, materials, and detailing.
- Coordinate the placement of street furnishings with utilities, street lighting, drainage structures, and other elements of the streetscape and pathways.



*Furnishings do not necessarily have to be expensive to be attractive and functional.*

## Signage

- Custom-made street signs can add personality and distinction to the road system. If the road will be turned over to the municipality, check with the public works department before committing to nonstandardized graphics and mounting systems.
- Conventional subdivisions are often marked by large, splashy signs and elaborate entrances. Consider minimal treatment – just using street signs – to emphasize the continuity between the new neighborhood and the surrounding community.
- Graphics for commercial areas within the neighborhood should be small in scale (in keeping with both municipal standards and your architectural guidelines) and attractive, without contributing to clutter along the street.



*An effective commercial sign that requires a minimum amount of text to convey its message.*



*An attractive and distinctive street sign.*

- The content of signs should be limited to the bare necessity. As a general rule, identification signs should be limited to a maximum of 30 letters.
- The use of sponsored signs (where the company’s logo is prominently displayed) should be avoided or prohibited.
- Signage presents an opportunity to visually tie the development together. It should be designed by a graphic designer experienced in the field of environmental graphics.



*A traditional Maine street sign. Vertical lettering, however, may be difficult to read, especially in emergencies.*



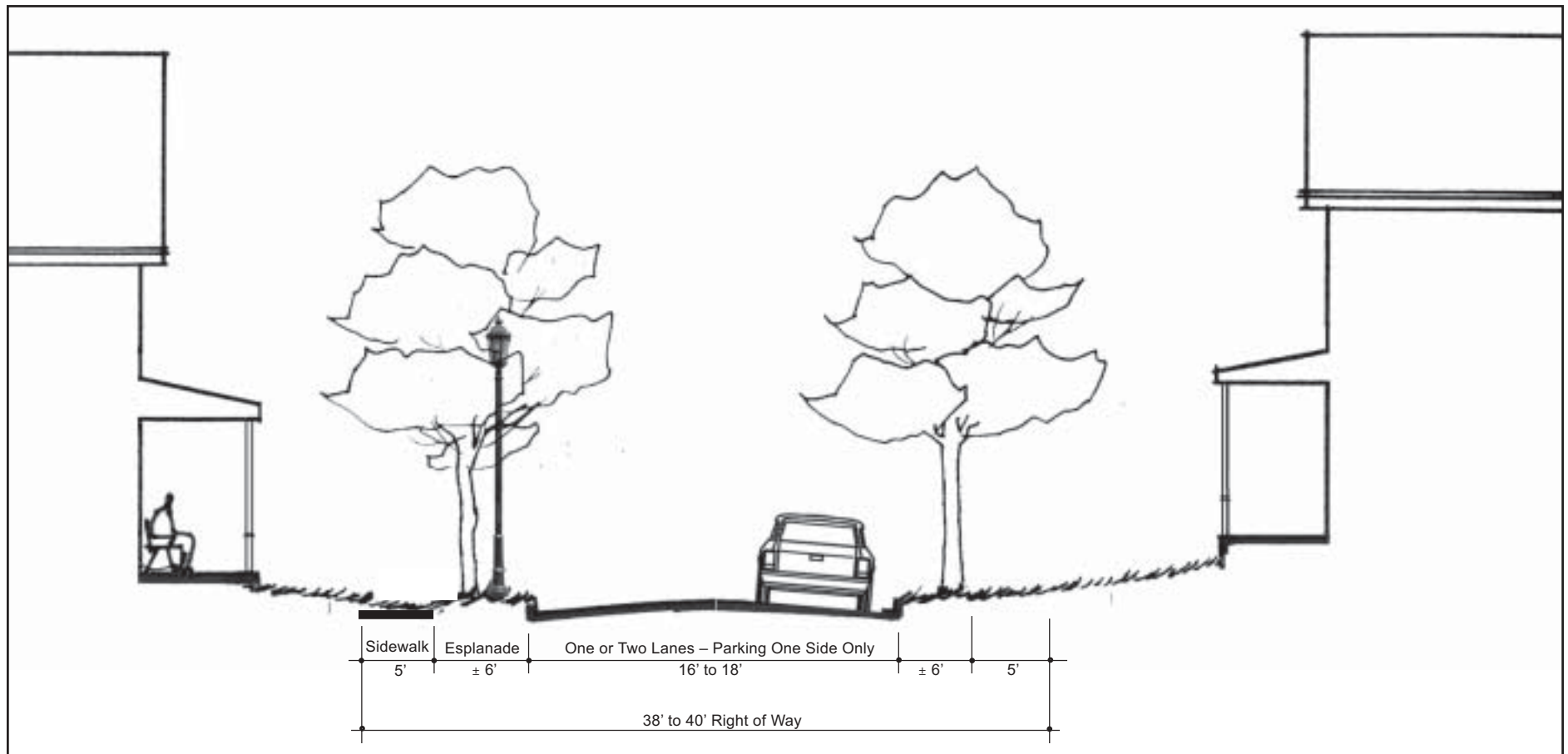
## MINOR ROADS

Minor roads should be used where traffic volumes are low – about 200 or fewer trips per day (i.e., typically serving up to 20 residences).

They are desirable and marketable because they tend to be safe, quiet, and neighborly. They should be designed along the same principles as streets, as outlined above. Indeed, because they require less right-of-way, some developers prefer them. In this example the ratio of the distance between the houses and their heights is about 2.5:1.

In some instances – e.g., where there are relatively few homes and no through traffic – pedestrians can share the minor road with motorists, eliminating the need for sidewalks and/or curbs.

*A tree lined minor street that serves both the pedestrian and low volume neighborhood traffic.*



## ALLEYWAYS

Alleyways – also known as service drives – are relatively narrow, paved travelways located in the middle of a block. They provide access to garages and/or the rear of the lots. While alleys may require additional paving, their costs can be offset by not installing long, off-street driveways. In some communities, alleys are used for overhead utilities, access to trash receptacles, and mail service.

### Advantages

- When garages are in the rear, the streetscape is not interrupted by driveways.
- The sidewalk becomes a safer place to play because driveways are eliminated.
- Without driveways off the street, homes have more side yard space with greater opportunity for privacy between homes.
- Alleys provide an alternate route for emergency vehicles. This is especially important if the emergency is at the rear of the home.

### Challenges

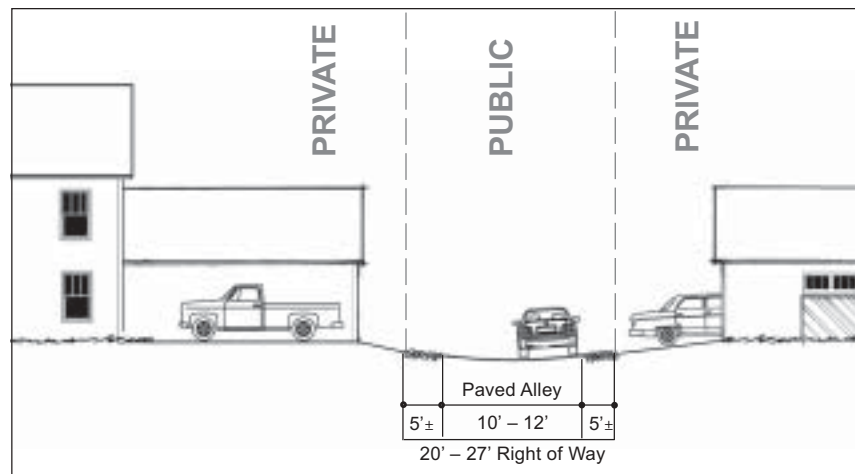
- Since alleys are not usually part of the public street network, snow removal, lighting, and repaving are typically the responsibility of a homeowners association.
- Snow removal and site drainage needs to be carefully planned.
- There may be some market resistance, since alleys rarely have been used in Maine.



*Alleys are an efficient way to minimize the impact of automobiles on a neighborhood.*

### Design

- Pedestrian scale street lighting should be provided for security. Fixtures should be shielded to prevent light from shining into homes.
- Alleys can be installed within their own right-of-way or over an access easement shared by abutting homeowners.
- In some instances drainage can be directed to the center of the alley, eliminating the need for dual catch basins.
- Alleys can provide space for the placement of above ground poles and wires.
- Alleys should be 10 to 12 feet in width.





## V. LOT LAYOUT

### OVERVIEW

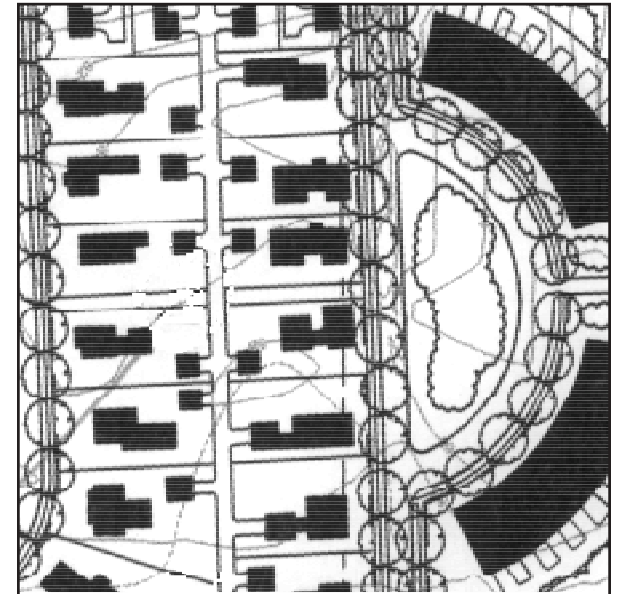
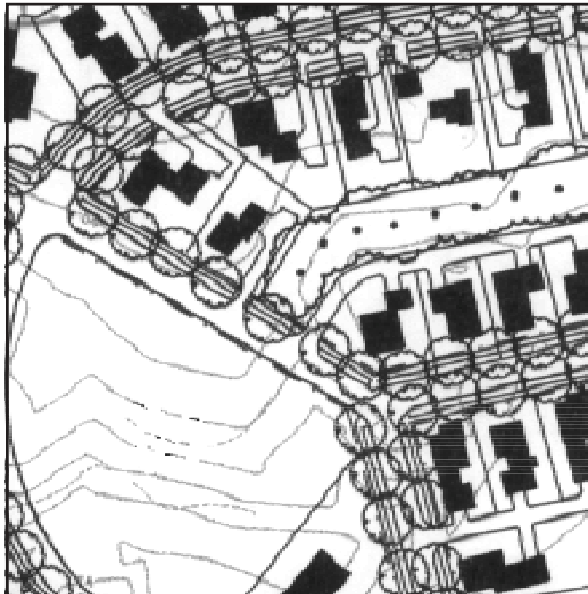
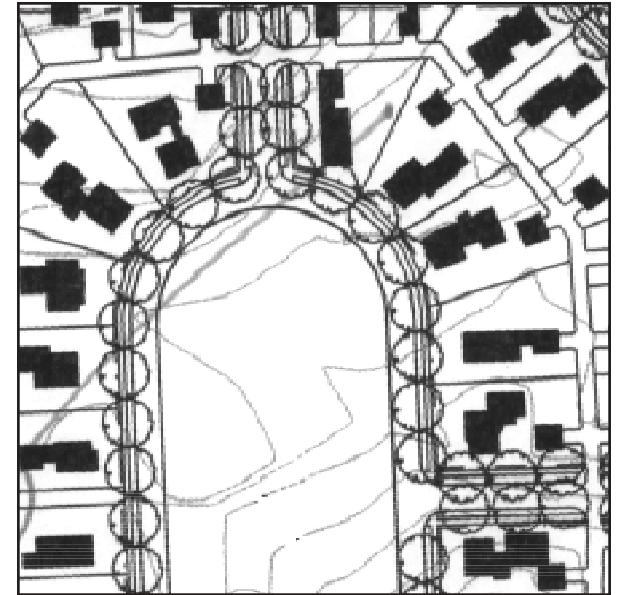
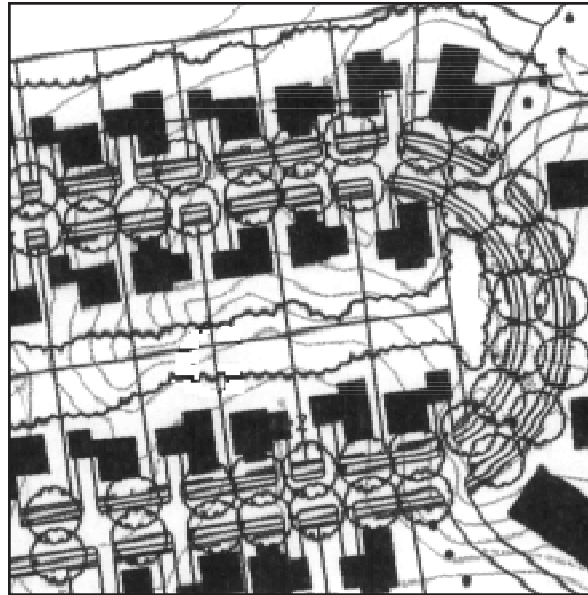
#### Creating a Neighborhood

The type, design, and layout of structures within the neighborhood define its character. Lot sizes, building and lot dimension, architectural details, and the form and type of buildings themselves give dimensional form to a Great American Neighborhood.

Lot sizes and building types will be determined by your target markets, development costs, and allowable density. This chapter illustrates how lot size and layout is critical to shaping desirable neighborhoods while making your development financially secure.

Balance between the particularity of each home and the harmonious relationship among the different houses is key to what makes a great neighborhood. Without it, you risk the chaos of a disjointed, disconnected whole or the drudgery of a repetitive, cookie cutter design. With it, you ensure elements of surprise and delight.

*Four parts of a Great American Neighborhood site plan. Variations in shape and size of lots reflect local topographic conditions and add interest to the streetscape. All homes are within walking distance of green space.*



## DENSITY

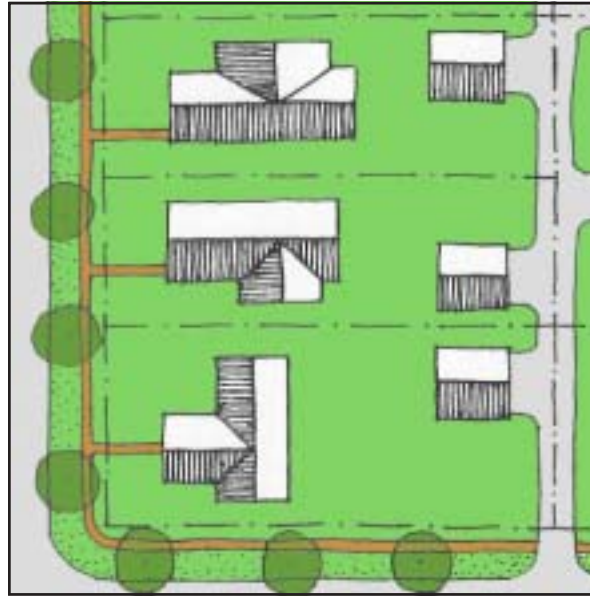
The net residential density of a Great American Neighborhood can vary from a low of 2 units per acre up to a high of 16 units per acre, or more. It depends mostly on lot size and building type. (See Appendix G for information about making neighborhoods work without public sewer systems.)

From a financial standpoint, density can make or break a project. You need to find that balance point where the density meets your marketing and financial goals. In the end, your development costs and profit must be covered by your sales.

In Great American Neighborhoods in Maine, the predominant residential type is, and will most likely continue to be, detached homes on lots ranging in size from 7,000 SF to 15,000 SF. This results in net residential densities of 3 to 6 units per acre (as illustrated in Figure A). The other three diagrams illustrate the effect of mixing duplexes, townhouses, and a small apartment building within the same size block. The addition of these types of residential units elevates the density in this half-acre area from 6 to 10, 12, and 16 units per acre. The gross development densities would, of course, be lower. Gross density includes all land, including open space and rights-of-way, in the calculation.

*'It is the feel of a neighborhood that is important to people, not its density... Density is simply a by-product of people trying to be at the same interesting spot.'*

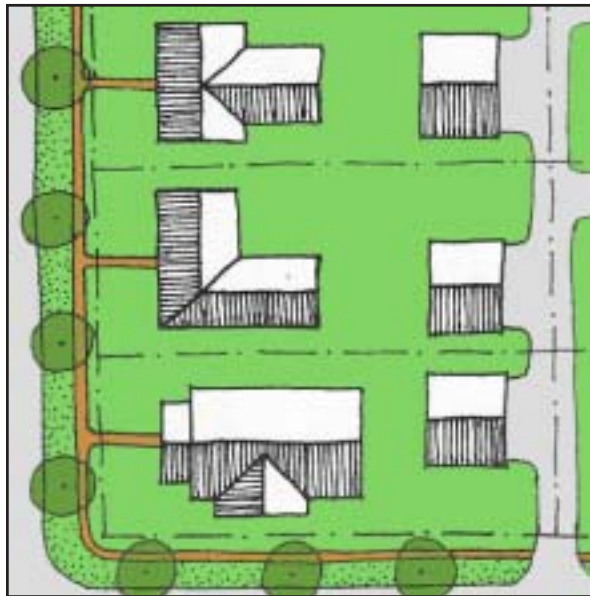
**David Sucher, *City Comforts: How to Build an Urban Village* (1995)**



*A. 3 single family homes on 3 lots totalling 1/2 acre: 6 dwelling units per net residential acre. Lots are variable in size: corner lot is 8,900 SF, the others are 7,000 SF.*



*B. 2 single family homes and 3 apartments: 10 dwelling units per net residential acre.*



*C. 3 duplexes (6 family units): 12 dwelling units per net residential acre.*

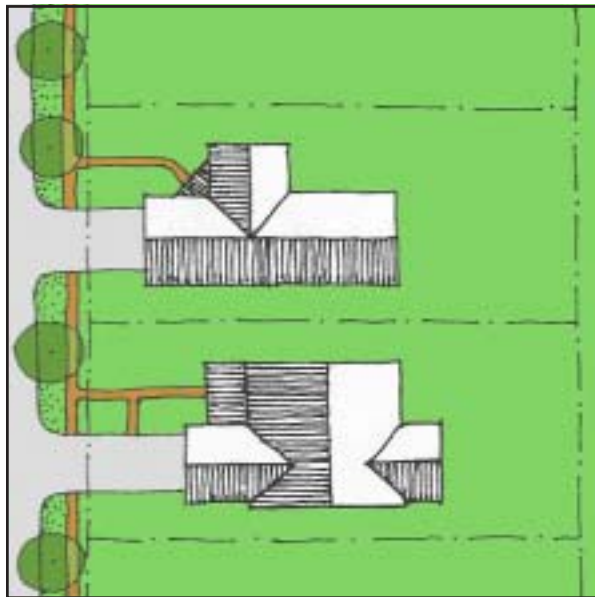


*D. 8 townhouses: 16 dwelling units per net residential acre.*

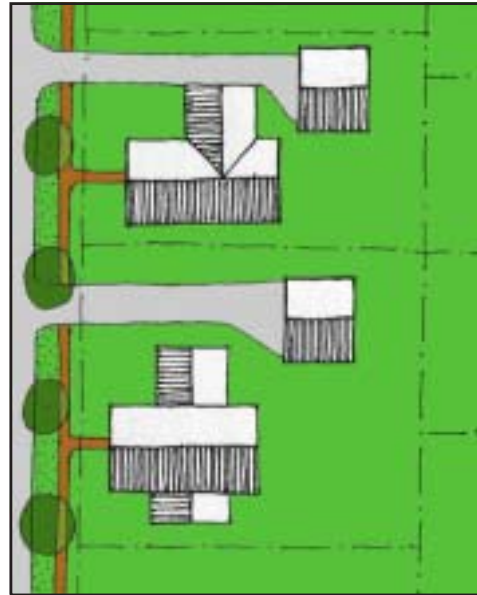


## Layout Options: Single Family, Detached Homes on 1/5 to 1/4 Acre Lots

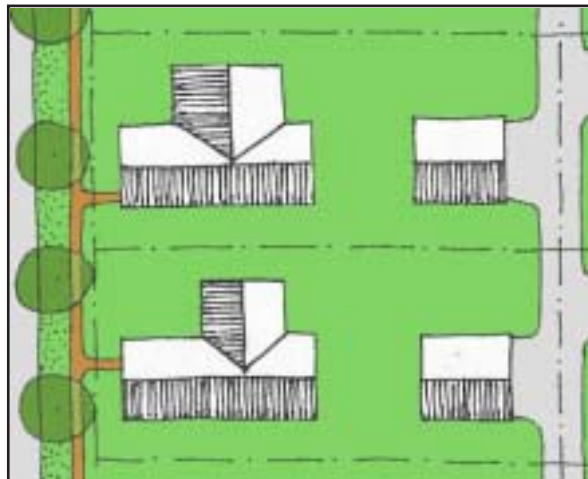
Figures A, B, and C show lots of various sizes – from 7,800 to 10,200 square feet – and approaches to accommodate family vehicles. Most homes are oriented toward the street, in traditional manner, with small, semipublic front yards and larger, more private side and back yards.



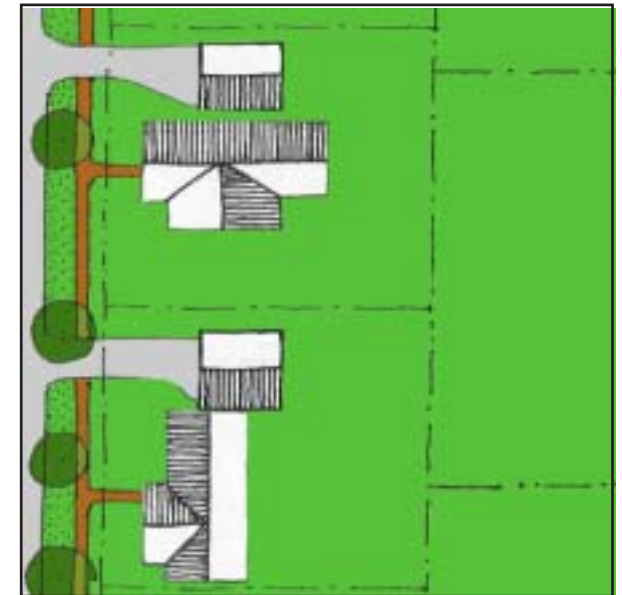
*A. Conventional Subdivision Approach. Generous back yard space can be created by placing double garages within the house structure, directly off the street. However, this results in driveways interrupting the sidewalk and garage doors dominating the street.*



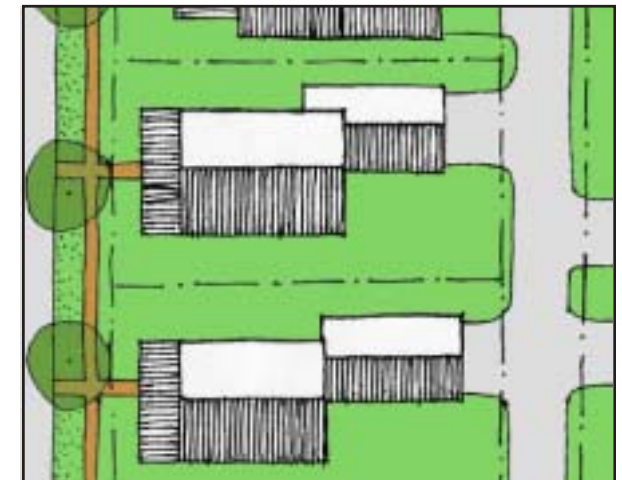
*B. Long narrow, off-street driveways, serving back yard garages, take up valuable yard space. On the other hand, the garages do not intrude on the street, and the hard surface on the driveway provides space for a basketball court and children's play. Garages also serve as privacy buffers, forming a solid wall between neighboring properties.*



*C. Alleys can eliminate off-street driveways while also creating more usable garden and yard space (especially if zero lot lines are permitted).*



*D. A variation on the layout shown in Figure B. In this case the house and garage are semi-detached. The garage is recessed in order to preserve the streetscape. Hard surface near the house still provides enough space for a basketball court and children's play.*



*E. A variation on the layout shown in Figure C. In this case, the house and garage are attached. A 'granny' apartment could be built over the garage. By placing the garage on, or closer to the side lot line, a more generous back yard is created.*

## Layout Options Duplexes, Townhouses, and Apartments

Duplexes, townhouses, granny flats, and apartments add variety and offer greater choice for those seeking to live in a Great American Neighborhood. Designed to a similar scale, and using the same architectural vocabulary as surrounding structures, they can fit easily and comfortably into the mix of housing offered.

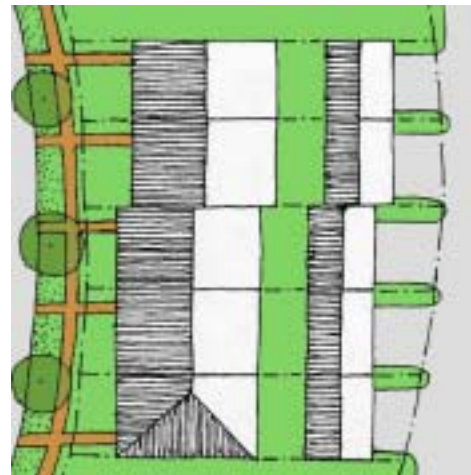
They can also fit harmoniously into blocks of single family homes, as the figures on this page illustrate. These examples represent net residential densities of 6 to 12 units per acre. Although the examples here show vehicular access from alleys, other options are possible, such as parking 'courts' set behind the buildings but accessed from the street.



*A. Mixing duplexes and townhouses within the same block creates higher density. The duplexes sit on 6,000 SF lots. The townhouse 'lots' are smaller at 3,600 SF each. In both cases the units have garages accessed off an alley. The garages can be either attached or detached.*



*B. In this row of townhouses, a wraparound porch and other architectural features celebrate the corner. Entrances are off small, fenced front yards next to the semipublic street space. Townhouses should be oriented to avoid fully shaded back yards, and to include attractive fencing and landscaping for back yard privacy. Single or double garages (or no garages) are options.*



*C. Townhouses with garages on 3,750 SF lots with no on street driveways. The townhouses have small, semipublic front yards and small back yards. Where the end unit is on a corner, the unit should be designed to take advantage of its location and window wall space.*



*D. This six-unit apartment building has on site parking for 12 vehicles on a 0.6 acre lot. The scale and mass of the building can be offset by a) treating the corner with architectural enhancements, b) providing edge landscaping on street sides, and c) adding first floor patios and upper floor balconies. All off street parking should be screened with appropriate planting and/or low walls or fencing.*



## LOT WIDTH AND FRONTAGE

Lots in a typical Great American Neighborhood are often long and relatively narrow. Small lots, ranging from 25 feet (for townhouses) to 70 feet in width, are the rule rather than the exception for a number of reasons. Small, narrow lots:

- Allow for denser development and more affordable housing because the houses cost less on a frontage-foot basis.
- Reduce the need for (and cost of) upkeep. There's less lawn to mow, fencing to repair, etc.
- Encourage neighborliness, because front porches, gardens, and next-door neighbors are closer together.
- Encourage house plans that are themselves long and narrow, with gable wall, front door, and porch facing the street.

Lot width can be diminished significantly if access to the rear of the lot is provided with an alley. An alley eliminates the need for multiple off-street driveways and/or garages facing the street. An alley acts as a common driveway and thus may reduce paving costs associated with individual driveways.

*Variable lot widths allow a wide variety of housing styles, add interest to the streetscape, and help preserve existing vegetation by allowing flexibility in home siting. Build-to lines help provide continuity within this variability.*

Much of what distinguishes new, and traditional, neighborhood streets has to do with the scale, height, and mass of the front facades of houses lining both sides of the street. Facades define and give shape to the street. Thus it is important to:

- Ensure a rhythm and continuity to the houses that face the street.
- Avoid the 'missing tooth' effect that's created when any one building is set back too deeply. Provide both minimum and maximum front yard setbacks (or 'build-to' lines) to accommodate variety within the neighborhood.
- Require that minimal architectural design guidelines are met, thus encouraging individuality within a consistent approach.

## Lot Frontage Averaging

Many Great American Neighborhoods use variable lot frontages that allow for double-lot effects, meet different price points, and account for variability in natural conditions. In these cases the average width may be 60 or 70 feet, but lots may range from 50 to 100+ feet in width. This approach will help avoid the 'cookie-cutter' look that can result from the same house being repeated on the same width lot.

In many older traditional neighborhoods, variable lot sizes and frontages were created by designating lots of 3000 to 5000 square feet and allowing single or multiple lot purchases.



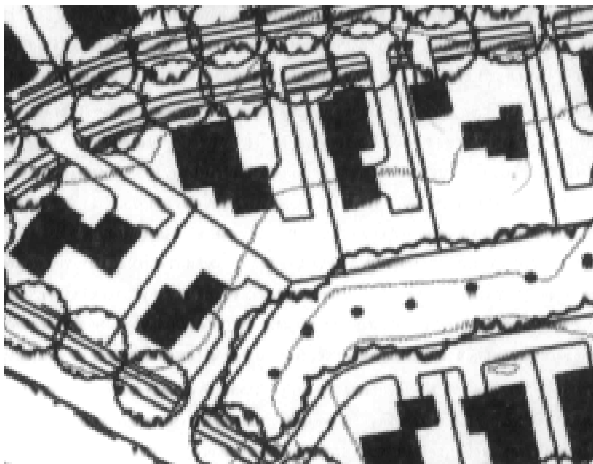
## LOT DEPTH AND SHAPE

Lot depth, especially for lots in the typical single family neighborhood, is usually 100 to 130 feet. When the block has an alley down its center, the lots may be less deep. Nonetheless, the 'typical' lot may be twice as long (or deep) as it is wide.

Corner lots, discussed in the next few pages, are the exception to this rule. They are often larger to emphasize the importance of the corner and to accommodate buildings designed to have two front facades.

Lot depth and shape is also a function of the land use, housing type, and need for a driveway. It is important to understand the needs of your target markets and the price point range you have identified. Townhouses or rowhouses (with zero side yard setbacks) can be placed on 25-foot wide lots. Work with an architect early on to determine the price and desirable width.

Duplexes and single family homes, designed to be placed on zero side lot line parcels, can also be accommodated on relatively narrow lots.



*The depth of the lots in this neighborhood are 3-5 times their width. Most lots are rectilinear with side lot lines at right angles to the street. Some lots are irregular, responding to variations in topography or drainage patterns.*

With a rectilinear block layout, lots tend to be rectangular in shape. However, if the topography and site features dictate, the shape of the lots will change. They may have wider or narrower frontage requirements. Keep your 'typical' house plans in mind so you are sure the lots are sized and shaped to accommodate different house designs, given setback requirements and the need for privacy and variety.



## CORNER LOTS

The corner lot presents an opportunity for creative design and architectural detailing. Corner buildings should be the most prominent structures on the street, with greater mass, height, and attention to detailing.

- The home or apartment on the corner is really part of two neighborhood streetscapes. The style and placement of windows, porches, and other architectural details should acknowledge this fact.
- While one face should be recognized as the 'front' of the building (e.g., by the front door, the mailbox, and the front porch), the other face should also present an interesting facade, in keeping with the character of other nearby homes.

**Privacy can be a concern** for the corner home, since two of its faces will be close to the street.



*A wraparound porch and projecting tower gives this home a dramatic presence for its corner location.*

- Porches can be an effective way to create semiprivate space between the front of the home and the street.
- Fences, grade changes, low retaining walls, and landscaping can also create semipublic space adjacent to the home.

**Garages on corner lots** present a siting and design challenge not found along the street.

- If the block is served by an alley, the garage doors should not be visible from the street.
- If there is no alley, the garage should be located as far from the corner as possible. This is generally the safest location because it is separated from the intersection.
- If garage doors must face the street, they should be integrated into the house facade with detailing, materials, and design. The garage should be recessed at least 4 feet from the front facade of the home.



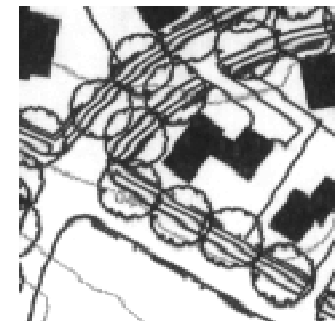
*The garage of this village home is located as far from the corner as possible and slightly recessed from the main facade.*



*Privacy on this corner property has been achieved by elevating the home above the surrounding grade and enclosing the porch.*



*The lines and massing of this prominent home create an effective streetscape on both faces.*



*This prominent corner lot is designed to accommodate a duplex or a larger single family home.*

## USABLE OUTDOOR SPACES

### The Front Yard

In a Great American Neighborhood, the front yard is privately owned but functions as a semipublic area. It is defined by the building wall and the edge of the sidewalk. Where homes, porches, and gardens are sited close to the street, opportunities are created for informal conversations with passersby. Further, by moving the home toward the street, the amount of private space in the rear yard will be maximized.

- Homes should be set within a prescribed distance from the street. This distance will vary, depending upon the width of the street and the anticipated speed limit. In most new neighborhoods, setbacks of 10-20' from the edge of the sidewalk should be adequate to create the separation needed for privacy.
- Local ordinances typically require a minimum front yard setback. In addition, Great American Neighborhoods should also establish maximum setbacks. These are also called 'build-to' lines, and can be an important organizing feature of the street. It is part of what allows the street to be designed as an outdoor 'room'. (See Street Cross Section, page 33.)
- There should be some opportunity for variation between the minimum and maximum setbacks if needed to preserve significant site features and to provide visual interest.



*In many traditional neighborhoods with homes sited close to the street, the front yard is largely ceremonial space that is part of the streetscape's 'outdoor room'.*

**The front yard is a semipublic space.** While it is part of the lot, it is also part of the public realm. Its value is as part of the outdoor room that creates curb appeal for the home and a place for interaction with neighbors.

- Front yards often need an edge to break the flow of public space that starts in the street. This can be accomplished with a subtle grade change, a low fence, a stone wall, or a hedge.
- Avoid high walls, large hedges, or fences that reduce opportunities for social interaction.
- Homeowners should be encouraged to be creative with front yard plantings, especially where the home is relatively close to the street. There are many low-maintenance alternatives to grass, such as perennial beds, groundcovers, and ornamental grasses, which can be used to personalize the front yard.

- Design guidelines may be helpful to buyers since the elements added by the homeowner will have a tremendous effect on the quality of the streetscape.
- Keep the front of the house, and especially the front door, visible from the street. Security is enhanced when there are 'eyes' on the street to watch neighborhood comings and goings.



*New homes are set close to the street, providing ample private space in the back yard for family activity.*

***'Place the building at the sidewalk. That's it. Don't make it complicated. If you question this, consider the places that most people like to go on vacation.'***

**David Sucher, *City Comforts: How to Build an Urban Village* (1995)**



## The Back Yard

Even a home on a small lot can be sited to give it a feeling of spaciousness and livability, while maintaining privacy. Since many lots in a Great American Neighborhood are rather deep, there are good opportunities to create interesting spaces for outdoor living.

**Visually enlarge the inside of the house** by treating the space around the home, the rear yard as well as the front yard, as outdoor ‘rooms’.

- Define these rooms with walls (fences, hedges, trees, or other vertical elements), floors (grass, groundcover, decorative paving), and ceilings (arbors, trellises).
- Consider the view from inside looking out. Add flowers, shrubs, or ornamental grasses for interest throughout the year.
- Furnish outdoor spaces to make them comfortable and inviting.



*Back yards should be private places, screened from the neighbors. Privacy is achieved by the placement of the garage, landscaping, and fencing.*

- Establish privacy with fencing, grape arbors, hedges, stacks of firewood, garden sheds, or other opaque vertical elements.

**Preserve nature** through careful site planning and monitoring construction.

- Use existing site features, such as large trees, rock outcrops, and grade changes, to add variety, personality, and privacy to the back yard.
- Inspect all trees for dead or dying branches before occupancy. Consult with a licensed arborist to ensure the safety of people who will be living under the trees.

**Keep the messy part of the household screened or out of view.**

- Provide room for trash cans, sports equipment, dog-runs, recycling bins, a compost heap, and other necessary items in a location that is out-of-the-way yet convenient.
- Small garden sheds attached to the house or garage can help reduce the clutter. Design them as an integral part of the house... avoid the ‘afterthought’ look.

**The wall of a rear garage** can be effective in defining space or simply to serve as a neutral background for the yard.

- Place the garage so it helps create usable outdoor space; use it to act as a privacy screen, windbreak, and/or to form a sunny outdoor barbecue patio.
- Design the garage to be an attractive addition to the view from the house.

- Add windows or decorative trim to give the wall scale.
- Garage walls and fences can support trellises for flowering vines or roses.

**Use appropriate plantings** that will complement the home and new neighborhood.

- Plant native species that are acclimated to Maine’s climate wherever possible; avoid the use of invasive plant species.
- Avoid plantings that will quickly outgrow their space, block windows, or require excessive maintenance.
- Use a variety of trees, shrubs, and other types of plantings to give each home a distinct personality. Appendix D contains a list of plantings that should survive throughout Maine. If in doubt, consult with a local nursery or landscape architect to determine the species most suitable to your growing conditions.



*Conventional subdivisions often pay little attention to privacy in the rear yard.*

## The Side Yard

Most side yards in a Great American Neighborhood will be relatively narrow and should be designed with care, with due consideration to their orientation, width, use, and landscaping. The yard space between houses is itself an outdoor ‘room’, so design it to be private yet accessible to its owners, while not imposing on the house next door. Unique and varied treatment of side yards is yet another way to provide diversity within a new neighborhood.

**Consider light and views** when designing and siting the home.

- Orient side yards so they are not constantly shaded. Provide access to sunlight – it is good for people and plants.
- Place windows and entryways to avoid direct views into the neighbor’s home.
- Design the yard, and use landscaping, low fencing, and trellises, to create useful outdoor space and attractive views.
- Use planted buffers, hedges, and trees to maintain privacy.

**Maximize the usable space available** on a relatively narrow lot.

- Try to avoid paving the entire side yard. If this is where the driveway is located, make it narrow and use attractive paving and plantings.
- Consider the use of common or shared drive-ways.

- Consider a zero lot line layout; i.e., locate the home on the side lot line with no setback. Usable space is gained on the other side. If zero lot line is used, make provision for access to the side of the home for maintenance.
- If the side yard provides access to the garage, treat it as an attractive courtyard, and not just a utilitarian driveway.



*The driveway in this wide side yard is separated from the house by a deep perennial border.*



*A simple wooden picket fence defines the side yard and effectively separates it from the street.*



*This side yard is a functional part of the stormwater system, using native grasses and wildflowers to help purify runoff in a shallow drainage swale.*



*The lush plantings in the side yard provide a greater sense of privacy for people using the wraparound porch.*



## VI. HOME SITING AND DESIGN

### OVERVIEW

The purpose of this section is to explore Maine's rich architectural heritage and draw upon those enduring principles – principles that have as much relevance today as yesterday – to help shape new neighborhoods. In all of these examples, the relationship of the house (and other buildings) to the street, its neighbors, and its front, back, and side yards is paramount.

### PORCHES AND ENTRANCEWAYS

The front of the home is an important component of the neighborhood streetscape. The character of the individual block is defined by the patterns of similarity and diversity in buildings, landscaping, and open spaces. When designing the front of the homes consider:



*Front porches, sidewalks, and a landscaped esplanade combine to make an attractive streetscape with clearly defined public and private spaces.*

- Front doorways should be highly visible from the street.
- Porches should be at least six feet deep to comfortably accommodate a place to sit. More depth and width is desirable for a playpen, space for rainy day activities, firewood storage, swing, or the countless other ways we use porches.
- Provide a place to set down groceries and bundles while searching for keys.
- If the home is close to the street, the front porch light should also illuminate the walk and sidewalk.
- If there is no porch, provide some type of covering over the front door for shelter from the elements. This can add an interesting architectural detail to further enhance the street.
- Ideally the level of the front porch should be raised two or three feet above the sidewalk. The grade change helps to define the semiprivate space.
- Where necessary, incorporate an access ramp into the house design – or design the home so a ramp can be easily added in the future – so it does not appear to be an afterthought.
- Provide opportunities to personalize the front of the home through street numbers, artwork, light fixtures, porch furnishings, etc.

- Design the roofline to provide shade in the summer while allowing sunlight to penetrate the inside of the home during winter months.
- Enhance the entrance with landscaping, using plantings, lighting, and other elements to create a highly visible welcoming space.



*The front door of this two-story home is emphasized by the handrailings and pediment.*



*A wraparound porch takes advantage of solar orientation to create a gracious, attractive entry.*

## HOUSE DESIGN / ORIENTATION

### Home Styles

- Select house designs appropriate to narrow lots. See Appendix E for sources of plans suited for Great American Neighborhoods.
- Select architectural styles that are complementary and have similar architectural forms and detailing.
- Aim for a streetscape that provides continuity while avoiding monotony and provides opportunity for occasional variability.
- Needless variety may be just as objectionable as too much similarity.

### Window Placement

- Windows should be square or vertical. Avoid horizontal window shapes and large picture windows facing the street.
- Locate some windows to provide ‘eyes’ on the neighborhood for informal surveillance and to allow the homeowner to view the front yard and sidewalk.
- Use divided panes to add scale to large window openings.
- Avoid placing windows where people can look into adjacent homes, especially across side yards.
- Avoid blank walls on homes and garages, especially on walls that face the street or other public areas

### Orientation

- Design most homes with the gable end to the street in the historic pattern for traditional neighborhoods. This orientation results in more efficient land use and a better streetscape. However, orienting an occasional home with greater frontage in the opposite direction will introduce variety into the streetscape.
- Consider offsetting lots across the street to provide variety along the streetscape and increase privacy.
- Orient indoor and outdoor living spaces for maximum solar gain.
- Site structures around existing trees. Avoid disturbing any of the ground underneath the drip line of the tree. As a rule of thumb, the setback from a tree in feet should be equal to its diameter in inches, i.e., leave at least 24 feet of clearance around a 24 inch diameter tree.
- Think about how and where the roofs will shed snow and design accordingly.



*Row homes can be an effective way to utilize tight sites and create intimate streetscapes.*



*Twin gables and porch face the street while broad steps emphasize the location of the front door.*



*The gable end of this home faces the street with the front door opening onto the porch.*



## PRIVACY

One of the common fears that homebuyers express when considering a relatively dense neighborhood is the lack of privacy.

Privacy should be a major consideration throughout the planning process. Privacy can be created at many levels:

### Public Space

- Use short streets, 'eyebrows' (page 29), and other appropriate road patterns to create neighborhoods with minimal traffic flow.
- Avoid siting gathering spaces and recreation areas in close proximity to individual homes.
- On busy streets and sidewalks, make the lots deeper and allow greater setbacks.



*Substantial setbacks and grade changes define the boundary between public and private space and preserve privacy.*

### Semi Public Space (front yard, walkway)

- Install low fencing, landscaping, stone walls, or other vertical elements at the lot line to establish the edge of the property.
- Ideally, each home should be accessible and meet ADA standards.
- Use grade changes (walls, sloped lawns, 2-3 steps) to mark the edge of the public right-of-way.



*Privacy has been achieved by fencing, landscaping, and a front porch rail. An access ramp is integrated into the addition to this historic home.*



*A low picket fence and landscaping along the sidewalk mark the edge of the owner's property. Hedges and a detached garage provide privacy from immediate neighbors.*



*The 20' wide side yard is a delightful space defined by a picket fence and shade trees.*



*If the gable ends of these houses faced the street the side yards would have been larger and more private.*



*Privacy is created by a solid wooden fence.*

### **Semi Private Space** (front porch, side yard)

- When laying out lots, take advantage of natural grade changes and vegetated areas.
- Develop lots with specific house plans in mind to create adequate side yards. As a general rule, the distance between homes should be at least as wide as the average house (where the narrow ends face the street).
- Vary lots sizes and placement of homes, garages, and accessways (see page 47).

- Front porches provide a place to watch the street.

### **Private Space** (rear yards, inside the home)

- Maximize private outdoor space by siting homes as close to the street as possible and concentrating personal space in the rear.
- Provide fencing or landscaping to enclose the rear yards, especially on corner lots.
- Develop house plans that work with minimal separation between adjacent homes.

- Provide decks, patios, and other outdoor living areas at the rear of the home. Enclose the space with fencing, landscaping, or walls designed as an extension of the home.
- Site garages at or near the side lot line, with access to maintain the side wall. This will create an edge for the neighbor's yard and provide the homeowner with privacy and the maximum amount of space in the rear.
- Position garages to maximize privacy between homes on opposite sides of an alley.



## ARCHITECTURAL GUIDELINES

Individual homes in a Great American Neighborhood can be designed by the developer, a builder, architect, or homeowner. The developer can provide homeowners with a variety of designs to choose from, based upon stock plans designed by an architect or building designer. Homeowners can bring their own designs, or an architect can be engaged to design one or more custom homes.

In some communities the planning board may require that designs be reviewed as part of the subdivision and site plan approval process. In others there may be no board review.

In either case it is wise to establish design guidelines to achieve an overall theme for the neighborhood. The guidelines should be an expression of your vision; they should set the boundaries for variability and uniformity. This will be especially important if there are multiple builders involved.

Some considerations for residential guidelines include:

- **Siting:** Position of the building on the lot, maximum lot coverage, garage placement, maximum/minimum setbacks, special situations (corner lots, focal points).
- **Building Design:** height and number of stories, minimum and maximum building size, architectural style, siding materials, window placement and style, trim, exterior colors, porches, position of doorways, chimney materials and placement, garage location and design.
- **Landscape:** lighting, fencing (material, location, height, detailing), stairs, plantings,

preservation of existing trees, walls (materials and heights), pets (dog houses and runs).

- **Utilities:** Trash storage, clotheslines and drying racks, satellite dishes, storage buildings.
- **Maintenance:** exterior of structures, yard, esplanade, street trees.
- **Alterations:** exterior changes, additions, enclosing porches.

Design guidelines will also be important if your project includes nonresidential structures (community buildings, mixed use, commercial structures, etc.). Signage will also need to be addressed.

You should decide whether to include a mechanism to enforce the guidelines once they are in place to ensure long-term quality control. This may be as simple as a basic deed restriction, or as comprehensive as a homeowners' association whose role includes enforcement of the guidelines.

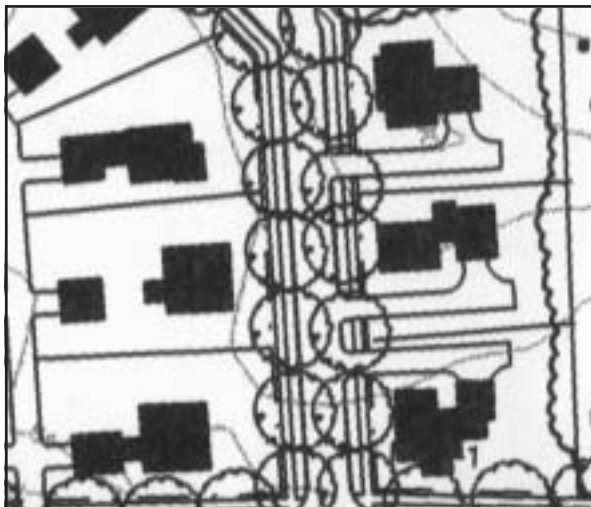


*Design guidelines in this residential community address window placement, setbacks, roof pitches, and building styles, allowing for individuality within a unifying theme.*

## GARAGE SITING AND DESIGN

People in Maine generally expect to have a garage, or at least a place on the lot that will allow them to build one in the future.

- There are many options for siting garages on the neighborhood lot: attached, detached, or semidetached and accessed from the street or from an alley at the rear (see sketch).
- To minimize the visual impact of numerous garage doors facing the neighborhood street, favor siting the garage to face the side or back of the lot if there is sufficient lot width.
- When the garage must face the street, set it back from the front facade so the front door of the home is prominent. Add trim or windows to the garage doors to bring them in scale with the facade of the home.
- Garages at the rear of the lot or recessed from the front facade create a greater sense of privacy by defining the rear or side yard.



*(Top) Front facing garages can create openings that are out of scale with the home. The front door is hidden behind the garage.*

*(Middle) This garage at the rear of the home does not compete with the front entrance for attention.*

*(Top Right) Garages can be used to create courtyards.*

*(Middle Right) Individual doors with decorative windows preserve the scale of the garage.*

*(Bottom Right) Recessing the garage preserves the importance of the entry and front porch. A side entrance and windows or dormers would have made the garage even less obtrusive.*



## FRONT YARD DESIGN

In historic village settings, the front yard was an important social space. It was the welcome mat that greeted the public and visitors. In a Great American Neighborhood, it remains important, although it's small, to provide more activity space – as well as privacy – in the back.

### The front yard is an important part of the streetscape

- When homes are set relatively close together, it's wise to have some measure of continuity between the front yard landscapes of adjacent properties.
- At the same time, there should be a measure of variety in the design of the landscape to add character to the neighborhood and give homes a unique identity.
- The depth of the front yard should reflect the hierarchy of the street – i.e., shallow setbacks for minor roads, deeper setbacks for higher volume streets and less dense neighborhoods.

### Plantings should be selected with an eye to their eventual height and form

- Coordinate planting plans so that, in 3-5 years when shrubs start to mature, they will be in scale with the front of the house. Planting plans should be prepared by a landscape architect or designer familiar with local growing conditions.
- Trees take 15-20 years to start to achieve maturity. The ultimate height of the tree needs to be considered accordingly. Evergreen trees that look wonderful in the front yard for the

first couple of years will ultimately outgrow their space, blocking windows and light. Instead, consider smaller ornamental trees – such as flowering crabapples – that will add scale and a colorful accent to the home and complement the shade trees along the street.

- Simplicity is generally the best approach to plantings in front of a home. Groups of similar shrubs and perennials will provide a good basic foundation for the yard.
- A list of shrubs, perennials, ground covers, and ornamental grasses that are suitable for many places in Maine is provided in Appendix D.
- To encourage the do-it-yourselfers, provide some simple plans that give them some ideas for the front yard.

### It may not be necessary to 'landscape' each front yard

Historic photographs of Maine homes often show no landscaping as we know it today in the front yard. Their preference was a simple lawn.

- Perennial beds, groundcovers, or ornamental grasses can be an effective (and often inexpensive) way to add seasonal color and texture to the semipublic, front yard landscape.
- A few well-placed shrubs or a small tree can frame a doorway, add mass to a corner, or accent an architectural detail.

*(Top) This flower garden extends a welcome mat from the front steps of the porch to the street.*

*(Middle) The simple formal landscape treatment reflects the symmetry of this village cape.*

*(Bottom) Low maintenance groundcover separates the sidewalk from the semiprivate front yard.*



## FENCING THE LOT

In Great American Neighborhoods, concern for pride of place and for human safety, comfort, and community should extend right down to the details. Fencing can be an attractive way to add personality to the streetscape, character to individual homes, and privacy to side and back yards.

Low fences around the front yard can define the line between the public and semipublic space.

- The white picket fence and stone walls are symbolic of New England. Fences and walls are good for marking boundaries and creating safe spaces for kids and pets. However, they can be overused, resulting in a dull sameness or an image that residents are overly concerned with security.
- While most traditional fencing is made from local lumber, there are a number of attractive alternatives in metal and synthetic materials, all of which minimize long-term maintenance.
- Pay particular attention to the detailing of fences and gates. If possible, repeat a pattern found on the house in the design of the fence.
- Avoid high fences (above eye level) in front yards. They are better suited to the privacy of a side or back yard.



*A simple post and rail fence marks the side boundary but does not offer any meaningful privacy.*



*A white picket fence effectively separates the sidewalk from the side yard on this corner home.*



*Decorative fences add a distinctive touch to these side yards.*



## APPENDICES

- A. Maine's Principles of Smart Growth
- B. New Urbanism Basics
- C. Suggested Street Trees
- D. Suggested Home and Open Space Plantings
- E. Sources of Additional Information
- F. Potential Sources of Financial Assistance
- G. How To Make Growth Areas Work Without Public Sewers: Three Approaches Plus 'None of the Above'



## APPENDIX A

### MAINE'S PRINCIPLES OF SMART GROWTH

The following Smart Growth Principles were developed by the EcoEco Smart Growth Forum. The Forum was an outgrowth of the Maine Environmental Priorities Project, which identified sprawl as a contributing factor to the most serious environmental problems facing the state. It was made up of representatives of home construction businesses, environmental interests, other interested organizations and individuals, and numerous state agencies. The State Planning Office worked closely with the forum to develop policy recommendations for the legislature.

1. Maintain Maine's historic settlement pattern of compact villages and urban centers separated by rural countryside and sustain a unique sense of place in every community by respecting local cultural and natural features.
2. Target economic and residential growth to compact, mixed use centers in areas with existing or planned infrastructure and services at a scale appropriate for the community and region.
3. Preserve and create mixed use, pedestrian-friendly neighborhoods that incorporate open areas, landscaping, and other amenities that enhance livability.
4. Provide choice in the mode of transportation and ensure that transportation options are integrated and consistent with land use objectives.

5. Protect environmental quality and important natural and historic features of the state and preserve large areas of unfragmented wildlife habitat and undeveloped land.
6. Encourage and strengthen agriculture, forestry, fishing, and other natural resource-based enterprises and minimize conflicts of development with these industries.
7. Reinvest in service centers and in downtowns and village areas, and support a diversity of viable business enterprises and housing opportunities in these areas.
8. Establish and maintain coalitions with stakeholders and engage the public in the pursuit of smart growth solutions.

9. Invest public funds and provide incentives and disincentives consistent with the vision expressed above.
10. For municipalities without significant growth pressures and/or small rural communities without substantial infrastructure, smart growth involves consideration of the above principles to the extent that they are applicable, and ensures that the development that does occur is accomplished in a manner that enhances community values, avoids incremental negative impacts, and is consistent with a sustainable and fiscally sound growth pattern.

*The village of Bayside, a summer cottage community in Northport.*





## APPENDIX B

### NEW URBANISM BASICS\*

In the late 1980s, a new approach to the creation and revitalization of communities began to emerge in North America. Based on the development patterns used prior to World War II, New Urbanism seeks to reintegrate the components of modern life – housing, workplace, shopping and recreation – into compact, pedestrian-friendly, mixed use neighborhoods linked by transit and set in a larger regional open space framework. New Urbanism is an alternative to suburban sprawl, a form of low-density development that consists of large, single use 'pods' – office parks, housing subdivisions, apartment complexes, shopping centers – all of which must be accessed by private automobiles.

Initially dubbed 'neo-traditional planning,' New Urbanism is best known for projects built in new growth areas such as Seaside (Walton County, Florida, 1981; Duany and Plater-Zyberk Town Planners), Kentlands (Gaithersburg, Maryland, 1988; Duany and Plater-Zyberk Town Planners) and Laguna West (Sacramento County, California, 1990; Calthorpe Associates). The principles which define New Urbanism can also be applied successfully to infill and redevelopment sites within existing urbanized areas. In fact, the leading proponents of New Urbanism believe that infill development should be given priority over new development in order to revitalize city centers and limit sprawl. An early manifesto by several leading New Urbanists states: '...we can, first, infill existing communities and, second, plan new communities that will more successfully

serve the needs of those who live and work within them' (Ahwahnee Principles, 1991, Local Government Commission). Unfortunately, many of the current social, political, and economic realities in the U.S. favor development at the metropolitan edge.

The **major principles** of New Urbanism are:

- **All development should be in the form of compact, walkable neighborhoods and/or districts.** Such places should have clearly defined centers and edges. The center should include a public space – such as a square, green or an important street intersection – and public buildings – such as a library, church or community center, a transit stop, and retail businesses.
- **Neighborhoods and districts should be compact (typically no more than one-quarter mile from center to edge) and detailed to encourage pedestrian activity without excluding automobiles altogether.** Streets should be laid out as an interconnected network (usually in a grid or modified grid pattern), forming coherent blocks where building entrances front the street rather than parking lots. Public transit should connect neighborhoods to each other and the surrounding region.
- **A diverse mix of activities (residences, shops, schools, workplaces, and parks, etc.) should occur in proximity.** Also, a wide spectrum of housing options should enable people of a broad range of incomes, ages, and family types to live within a single neighborhood/district. Large developments featuring a single use or serving a single market segment should be avoided.

- **Civic buildings, such as government offices, churches, and libraries, should be sited in prominent locations.** Open spaces, such as parks, playgrounds, squares, and greenbelts should be provided in convenient locations throughout a neighborhood.

Developers, planners, local government officials, and citizens have all shown great interest in New Urbanist design approaches, particularly in regions that are experiencing conflicts related to growth. Many see New Urbanism as a win-win approach that enables a community's growth to be channeled into a physical form that is more compatible with the scale of existing neighborhoods, that encourages healthy physical activity, that discourages auto use, that is less costly to service, and that is less consumptive of land and natural resources.

In addition, research on head-to-head comparisons of single family homes arranged in new urbanist neighborhoods versus conventional subdivisions has found that consumers pay a price premium (average of 11%) for the new urbanist setting. Because of these benefits, several hundred developments on the new urbanist model have been built in the United States, both infill and on new tracts, in both urban and suburban settings.

However, this model has not yet taken off in New England, including Maine. This may be due to the smaller markets and the smaller expected absorption rates in New England, although new urbanist projects can be phased in small increments. Another reason is that this model's physical design standards and implementation practices are not fully compatible with the regulatory framework of New England's communities.

---

\* In this Guide, New Urbanist neighborhoods are referred to as "Great American Neighborhoods."

For example many fire departments require streets that are wider than those proposed by New Urbanists. Zoning laws often discourage secondary living units within established residential areas or require large setbacks for homes and businesses.

Another reason for the slow adoption of New Urbanism is that the real estate industry is highly segmented by land use category (such as single family housing, multifamily housing, retail, office, and warehouse). Each category has its own practices, markets, trade associations, and financing sources. The highly integrated development strategy advocated by the New Urbanists requires a more holistic approach to community-building than the real estate industry is currently structured to deliver. However, in the face of these challenges, New Urbanist communities are consistently achieving much higher sale prices than those in more conventional adjacent developments.

Despite such barriers, public opposition to conventional suburban development is creating greater demand for alternative forms of growth, such as New Urbanism. To address this need, a coalition of architects, urban designers, developers, government officials, and others formed the Congress for the New Urbanism (CNU) in 1993 to advance the principles of New Urbanism and promote their broad application. Since then the organization has hosted a series of annual meetings and drafted a Charter of the New Urbanism (ratified in May, 1996).



*South Freeport village embodies most of the principles of a Great American Neighborhood.*



## APPENDIX C

### SUGGESTED STREET TREES

The trees on this list have been derived from a number of Maine sources to inspire greater landscape variety in traditional neighborhood developments. The final selection should consider the specific growing requirements and characteristics of each tree and the conditions present within the site.

This list was developed for the southern regions of Maine. Not all trees may be suitable for all regions in Maine. Check with a local nursery or landscape professional to be assured of the trees' tolerance to severe winter conditions, or contact the local University of Maine Extension Service or Natural Resource Conservation District (USDA) office.



*Trees can be used to define the edge of the travel way, shade sidewalks, and add accents to the streetscape.*

### SHADE TREES

Aesculus hippocastanum	Baumanii Horsechestnut
Acer campestre	Hedge Maple
Acer x. freemanii	Armstrong Maple
Acer x. freemanii	Autumn Flame Maple
Acer rubrum	Red Maple
Acer saccharum	Sugar Maple
Acer tataricum	Tartarian Maple
Acer triflorum	Three-flower Maple
Amelanchier	Shadblow
Betula nigra	River Birch
Carpinus betula fastigiata	Upright Hornbeam
Carpinus caroliniana	American Hornbeam
Cercidiphyllum japonicum	Katsura Tree
Cladrastis lutea	Yellowwood
Corylus columna	Turkish Filbert
Crataegus crusgalli	Cockspur Hawthorn
Fraxinus americana	White Ash
'Autumn Purple'	
'Autumn Applause'	
Ginkgo biloba	Maidenhair Tree
Gleditsia triacanthos	Thornless Honey Locust
Gymnocladus dioicus	Kentucky Coffee Tree
Magnolia acuminata	Cucumber Tree
Nyssa sylvatica	Tupelo
Prunus accolade	Accolade Cherry
Prunus maackii	Amur Chokecherry
Pyrus calleryana	Cleveland Pear
Quercus bicolor	Swamp White Oak
Quercus coccinea	Scarlet Oak
Quercus imbricaria	Shingle Oak
Quercus palustris	Pin Oak
Quercus robur	Upright English Oak
Quercus rubra	Red Oak
Quercus shumardi	Shumard Red Oak
Sorbus alnifolia	Korean Mountain Ash
Syringa reticulata	Japanese Tree Lilac
Tilia cordata	Littleleaf Linden
Ulmus parvifolia	Lacebark Elm
Ulmus americana	Princeton American Elm
Ulmus americana	Frontier Elm
Zelkova serrata	Zelkova

### ORNAMENTAL TREES

Acer campestre	Hedge Maple
Acer ginnala	Amur Maple
Aesculus pavia	Red Buckeye
Amelanchier canadensis	Serviceberry
Calicanthus floridus	Carolina Alspsice
Carpinus betulus	European Hornbeam
Carpinus carolineanum	American Hornbeam
Cornus kousa	Kousa Dogwood
Cornus mas	Cornealiancherry Dogwood
Cotinus obovatus	American Smoketree
Crataegus crus-galli	Cockspur Hawthorne
inermis 'cruzam	
Crataegus viridis	Winter King Hawthorne
Halesia carolina	Carolina Silverbell
Maacki amurensis	Maackia
Magnolia stellata	Star Magnolia
Malus species	Crabapple
Nyssa sylvatica	Tupelo
Ostrya virginiana	Ironwood
Phellodendron arboreum	Amur Corktree
Prunus subhirtella	Higan Cherry
	'Autumnalis'
Pyrus calleryana	Bradford Pear
Sorbus alnifolia	Korean Mountain Ash
Syringa reticulata	Ivory Silk Tree Lilac

## APPENDIX D

### SUGGESTED HOME AND OPEN SPACE PLANTINGS

The plant material in this list is provided to inspire greater landscape variety around the homes and open spaces in traditional neighborhood developments. This list should be considered a starting point. The final selection should consider the specific growing requirements and characteristics of each plant and the conditions present within the site. There are many more shrubs, perennials, and ornamentals available to add richness and variety to the landscape.

This list was developed for the southern regions of Maine. Not all plants on the list may be suitable everywhere in Maine. Check with a local nursery or landscape professional to be assured of the plants' tolerance to severe winter conditions. Or contact the local University of Maine Extension Service or the Natural Resource Conservation District (USDA) office.

To avoid planting invasive species, please check with [www.nae.usace.army.mil](http://www.nae.usace.army.mil) and go to pages 28-31 of the *New England District Mitigation Guidance*.

### ORNAMENTAL SHRUBS

Aesculus parviflora	Bottlebrush Buckeye
Aronia arbutifolia	Red Chokeberry
Clethra alnifolia	Summersweet Clethra
Cornus sericea	Redtwig Dogwood
Cornus kousa	Kousa Dogwood
Cotinus coggygria	Common Smoketree
Cotoneaster adpressa	Creeping Cotoneaster
Cotoneaster divaricatus	Spreading Cotoneaster
Cotoneaster horizontalis	Rockspray Cotoneaster
Deutzia gracilis	Slender Deutzia
Enkianthus campanulatus	Redveined Enkianthus
Forsythia 'Sunrise'	Sunrise Forsythia
Hydrangea paniculata	Panicle Hydrangea
Ilex verticillata	Winterberry
Myrica pensylvanica	Bayberry
Pinus mugo	Mugho Pine
Potentilla fruticosa	Bush Cinquefoil
Prunus cistena	Sand Cherry
Prunus maritima	Beach Plum
Rhododendron species	Rhododendron sp.
Spirea bumaldi	Anth'ny Waterer's Spirea
Viburnum prunifolium	Blackhaw Viburnum
Viburnum sargentii	Sargent Viburnum
Viburnum trilobum	American Cranberrybush



### PERENNIALS

Achillea millefolium	Yarrow
Aster x novae ongliae	New England Aster
Astilbe species	Astilbe
Coreopsis verticillata	Moonbeam Coreopsis
Echinacea purpurea	Purple Coneflower
Geranium sanguinum	Cranesbill
Hemerocallis species	Daylilies
Iris siberica	Siberian Iris
Liatris spicata	Gayfeather
Malva alcea 'Fastigiata'	Hollyhock Mallow
Monarda didyma nepeta	Bee Balm
Perovskia atriplicifolia	Russian Sage
Rudbeckia 'Goldstrum'	Black-Eyed Susan
Sedum telephium	Autumn Joy Sedum

### SHADE-LOVING PERENNIALS AND GROUNDCOVERS

Astilbe species	Astilbe
Dennstaedtia punctilobula	Hay Scented Fern
Galium odoratum	Sweet Woodruff
Hosta species	Hosta Lily
Osmunda cinnamomea	Cinnamon Fern
Pachysandra terminalis	Japanese Spurge
Vinca minor	Periwinkle

### ORNAMENTAL GRASSES

Calamagrostis acutiflora	Feather Reed Grass
Deschampsia caespitosa	Tufted Hair Grass
Helictotrichon sempervirens	Blue Oat Grass
Miscanthus sinensis	Purple Silver Grass
Phalaris arundinacea	Ribbon Grass
Chasmanthium latifolium	Northern Sea Oats
Pennisetum alopecuroides	Fountain Grass

*Shrubs, ornamental grasses, and perennials can enliven the landscape and provide visual interest to the street.*



## APPENDIX E: SOURCES OF ADDITIONAL INFORMATION

### PUBLICATIONS

- Alexander, Christopher. *A Pattern Language: Towns, Buildings, Construction*. New York University Press, 1997.
- Ames, Stephen. *A Guide to Community Visioning: Hands on Information for Local Communities*. Chicago: APA Planning Press, 1998.
- Arendt, Randall et al. *Rural by Design: Maintaining Small Town Character*. APA Planners Press, 1994.
- Arendt, Randall. *Crossroads, Hamlet, Village, Town: Design Characteristics of Traditional Neighborhoods, Old and New*. APA Planners Press, 1999.
- Bragado, Nancy et al. *Building Livable Communities: A Policymaker's Guide to Infill Development*. The Center for Livable Communities, 2001.
- Brooke, Steven. *Seaside*. Gretna, Louisiana: Pelican Publishing Company, 1995.
- Burden, Dan et al. *Street Design Guidelines for Healthy Neighborhoods*. Local Government Commission Center for Livable Communities, Sacramento, 1999.
- Calthorpe, Peter. *The Next American Metropolis: Ecology, Community, and the American Dream*. Princeton Architectural Press, 1993.
- Campoli, Julie, et al. *Above and Beyond: Visualizing Change in Small Towns and Rural Areas*. Chicago: Planners Press, 2002.
- Celebration Company. *Celebration Pattern Book*. Celebration, Florida, March 1995.
- Charry, Barbara. *Conserving Wildlife in Maine's Developing Landscape*. Maine Audubon Society, 2000.
- Chellman, Chester, P.E. *The Design of New Urbanist Streets*. Urban Land Institute, 2000.
- Courtney, Elizabeth. *Vermont's Scenic Landscapes: A Guide for Growth and Protection*. Vermont Agency of Natural Resources. Waterbury, 1991.
- Craighead, Paula. *The Hidden Design in Land Use Ordinances: Assessing the Visual Impact of Dimensions Used for Town Planning in Maine Landscapes*. Portland: University of Southern Maine, 1991.
- Dittmar, Hank and Shelley Poticha. "Transportation and the New Urbanism", *Progress*, Surface Transportation Policy Project, November 1999.
- Duany, Andres, Elizabeth Plater-Zyberk, and Jeff Speck. *Suburban Nation, the Rise of Sprawl and the Decline of the American Dream*. New York: North Point Press, 2000.
- Duany Plater-Zyberk & Company, *The Lexicon of the New Urbanism*. Miami, 1999.
- Dutton, John A. *New American Urbanism: Reforming the Suburban Metropolis*. Skira, Milan, 2000.
- Eppli, Mark and Charles C. Tu. *Valuing the New Urbanism, the Impact of the New Urbanism on Prices of Single-Family Homes*. Urban Land Institute, Washington, 1999.
- Ewing, Reid. *Best Development Practices*. Chicago: Planners Press, 1996.
- Ewing, Reid. *Transportation and Land Use Innovation: When You Can't Pave Your Way Out of Congestion*. Chicago: Planners Press, 1997.
- Fulton, William. *The New Urbanism, Hope or Hype for American Communities?* Lincoln Institute of Land Policy, Cambridge, 1996.
- Greenan, Gary, ed. *Traditional Neighborhood Development*, Architectural Graphic Standards. John Wiley & Sons, Hoboken, NJ. 2000
- International City/County Management Association. *Getting to Smart Growth: 100 Policies for Implementation*. International City/County Management Association, 2003.
- Jarvis, Frederick D. *Site Planning and Community Design for Great Neighborhoods*. National Association of Home Builders, Washington: Home Builder Press, 1993.
- Jones, Bernie. *Neighborhood Planning: A Guide for Citizens and Planners*. Chicago: Planners Press, 1990.
- Katz, Peter. *The New Urbanism: Toward an Architecture of Community*. McGraw-Hill, 1994.

- Keeley, David. *Markets for Traditional Neighborhoods in Midcoast Maine. A Survey of Residents Living in Midcoast Maine Regarding Preferences in Home Location along With Analysis of Housing Demand.* Maine State Planning Office, Augusta, Maine, April 2003.
- Kunstler, James Howard. *Home from Nowhere: Remaking Our Everyday World for the 21st Century.* Simon & Schuster, 1996.
- Leccese, Michael and Kathleen McCormick. *Charter of the New Urbanism.* New York: McGraw-Hill, 1999.
- Longo, Gianni. *A Guide to Great American Places, A journey of discovery, learning and delight in the public realm.* New York: Urban Initiatives, 1996.
- Maine Forest Service. *What Do Trees Have to Do with It? A Forestry Guide for Communities.* Maine Forest Service, Augusta, Maine, 2000.
- Maine State Planning Office. *Community Visioning Handbook.* Maine State Planning Office, Augusta, Maine, 2003.
- Maine State Planning Office. *Cost of Sprawl.* Maine State Planning Office, Augusta, Maine, May 1997.
- McHarg, Ian. *Design With Nature.* Wiley, 1995.
- Miller, Jason, and John Anderson. *Traditional Neighborhood Design: A Pattern Book for Housing.* Homestyles Publishing and Marketing, Inc. Minneapolis. 1997
- Neleson, Anton. *Visions for a New American Dream: Process, Principles, and an Ordinance to Plan and Design Small Communities.* APA Planners Press, 1993.
- Places, A Forum of Environmental Design. "The Promise of New Urbanism." Spring 2000.
- Project for Public Spaces, Inc. *How to Turn a Place Around: A Handbook for Creating Successful Public Spaces.* New York: Project for Public Spaces, Inc., 2000.
- Reynolds, Mary and H. Sharon Osesenbruggen. *Planting Trees in Designed and Built Community Landscapes: Checklists for Success.* Concord: NH State Forester's Office, 1999.
- Richert, Evan. *Markets for Traditional Neighborhoods: An Analysis of a Survey of Recent Homebuyers in Maine.* Maine State Planning Office, Augusta, Maine, August 1999.
- Richert, Evan. *Why Households Move: Two Maine Surveys.* Maine State Planning Office, Augusta, Maine, August 1999.
- Rybczynski, Witold. *A Clearing in the Distance; Frederick Law Olmsted and America in the Nineteenth Century.* Scribner, 1999.
- Schuster, J. Mark, Roger Simmonds, and Dennis Fenchman. *Housing Design and Regional Character, A Primer for New England Towns.* Cambridge: Environmental Design and Development Group, MIT, 1988.
- Sucher, David. *City Comforts: How to Build an Urban Village.* Seattle: City Comforts Press, 1995.
- Sutro, Suzanne. *Reinventing the Village: Planning, Zoning, and Design Strategies.* American Planning Association, 1990.
- Transportation and Growth Management Program. *Appendix: Smart Development Code Handbook.* Salem, Oregon, Oregon Department of Transportation and Oregon Department of Land Conservation and Development, 1999.
- Transportation Planning Council Committee, *Traditional Neighborhood Development Street Design Guideline.* Institute of Transportation Engineers, 1997.
- Urban Design Associates. *The Urban Design Handbook, Techniques and Working Methods.* W.W. Norton & Company, New York, 2003.



## WEB SITES

Active Living By Design  
[www.activelivingbydesign.org](http://www.activelivingbydesign.org)

ADS Project: Alternative Development Standards  
for Sustainable Communities  
[www.sustainable-communities.agsci.ubc.ca/  
projects/ADS.html](http://www.sustainable-communities.agsci.ubc.ca/projects/ADS.html)

Affordable Housing Design Advisor  
[www.designadvisor.org/gallery/gallery.html](http://www.designadvisor.org/gallery/gallery.html)

Center for Livable Communities  
[www.lgc.org/center](http://www.lgc.org/center)

Center for Neighborhood Technology  
[www.cnt.org](http://www.cnt.org)

Center for Watershed Protection  
[www.cwp.org](http://www.cwp.org)

Center of Excellence for Sustainable Develop-  
ment (US Department of Energy)  
[www.sustainable.doe.gov/management/  
geninfo.shtml#1](http://www.sustainable.doe.gov/management/geninfo.shtml#1)

Community Planning Website  
[www.communityplanning.net](http://www.communityplanning.net)

Computer Visualization Technologies to Evaluate  
Design Alternatives for a Sustainable Community  
[www.arch.umanitoba.ca/la\\_www/sustainable/  
survey/survindx.htm](http://www.arch.umanitoba.ca/la_www/sustainable/survey/survindx.htm)

Congress for the New Urbanism  
[www.cnu.org](http://www.cnu.org)

Cyberbia Resource Directory - Urban Design and  
New Urbanism  
[www.cyberbia.org/directory](http://www.cyberbia.org/directory)

Designing Safe Communities and Neighborhoods  
[www.asu.edu/caed/proceedings99/](http://www.asu.edu/caed/proceedings99/)

GrowSmart Maine  
[www.GrowSmartMaine.org](http://www.GrowSmartMaine.org)

Lincoln Institute  
[www.lincolninst.edu/index-high.asp](http://www.lincolninst.edu/index-high.asp)

Maine Olmsted Alliance for Parks & Landscapes  
[www.maineolmsted.org](http://www.maineolmsted.org)

Maine State Planning Office  
[www.maine.gov/spo](http://www.maine.gov/spo)

Michigan Land Use Institute  
[www.mlui.org/GrowthManagement.index.asp](http://www.mlui.org/GrowthManagement.index.asp)

National Charrette Institute  
[www.charretteinstitute.org](http://www.charretteinstitute.org)

Neighborhood Charrette Handbook  
[www.louisville.edu/org/sun/planning/char.html](http://www.louisville.edu/org/sun/planning/char.html)

New England Light Pollution Advisory Group  
[cfa-www.harvard.edu/cfa/ps/nelpag.html](http://cfa-www.harvard.edu/cfa/ps/nelpag.html)

New Tools for Community Design and Decision-  
Making: An Overview  
[www.sustainable.doe.gov/toolkit/TCDDM/  
HOME2.htm](http://www.sustainable.doe.gov/toolkit/TCDDM/HOME2.htm)

New Urban News  
[www.newurbannews.com/](http://www.newurbannews.com/)

Oregon Land Use Information Center  
[darkwing.uoregon.edu/~ppm/landuse/  
land\\_use.html](http://darkwing.uoregon.edu/~ppm/landuse/land_use.html)

Penn SCAPE  
[www.pennscapes.psu.edu/pennscapes/default.htm](http://www.pennscapes.psu.edu/pennscapes/default.htm)

Project for Public Spaces  
[www.pps.org](http://www.pps.org)

Smart Growth Network  
[www.smartgrowth.org](http://www.smartgrowth.org)

Sprawl Guide Home Page  
[www.plannersweb.com/articles/sprawl/  
articles.html](http://www.plannersweb.com/articles/sprawl/articles.html)

SprawlWatch Clearinghouse  
[www.sprawlwatch.org](http://www.sprawlwatch.org)

St. Croix Valley Development Design Study:  
Growing Smart in Minnesota  
[www.metrocouncil.org/planning/stcroixvalley/  
stcroixdev.htm](http://www.metrocouncil.org/planning/stcroixvalley/stcroixdev.htm)

The Rivers, Trails and Conservation Assistance  
Program, National Park Service  
[www.nps.gov/nrcr/programs/rtca/index.html](http://www.nps.gov/nrcr/programs/rtca/index.html)

The Town Paper  
[www.tndtownpaper.com](http://www.tndtownpaper.com)

Traffic Calming Homepage - Portland, OR  
[www.trans.ci.portland.or.us/Traffic\\_Management/  
TrafficCalming/default.htm](http://www.trans.ci.portland.or.us/Traffic_Management/TrafficCalming/default.htm)

Walkable Communities, Inc.  
[www.walkable.org](http://www.walkable.org)

Washington State DOT: Pedestrian Research /  
Resources  
[www.wsdot.wa.gov/walk](http://www.wsdot.wa.gov/walk)

## OTHER SOURCES

Pennsylvania State University. PA Blueprints:  
Best Land Use Principles & Results, Interactively  
Shown. Dept. of Landscape Architecture. 1997.

## **APPENDIX F**

### **POTENTIAL SOURCES OF FINANCIAL ASSISTANCE**

There are several potential sources of financial assistance at the state level to promote the concepts of the Great American Neighborhood Program and funding availability changes over time. Check with agencies concerning availability of the programs listed, and/or new programs, early in your planning process.

#### **STATE PLANNING OFFICE**

##### **Great American Neighborhood Partnership Grants**

The State Planning Office offers Great American Neighborhood Partnership grants (maximum \$5,000) available to communities that wish to work with a landowner or developer in planning, creating, or adding to a mixed use traditional neighborhood. The community and the landowner/developer are expected to each contribute an equal amount of matching funds. Funds support a wide range of planning topics, from concept designs to traffic impact studies to market demand analysis, depending on the individual needs of the project.

##### **Patient Sewer Loan Program**

The Patient Sewer Loan pilot program is available to assist Maine cities and towns that wish to encourage neighborhood development in residential growth areas. The Program is a cooperative effort of the Maine Municipal Bond Bank, the Maine departments of Environmental Protection and Economic and Community

Development, the State Planning Office, and the U.S. Environmental Protection Agency. The goal is to provide very low interest loans for financing the extension of sewer services to eligible new neighborhoods.

##### **Regional Challenge Grant Program**

The Regional Challenge Grant Program provides non competitive grants to support promising regional initiatives designed to establish new mechanisms for managing governmental affairs more efficiently while integrating transportation, economic development, natural resource protection, and land use management more effectively, consistent with smart growth principles. If a proposed neighborhood project is of regional significance (for example, is located in more than one community or benefits more than one community) it may qualify for this grant program.

Contact John DelVecchio at the State Planning Office at (207) 287-8058, (800) 662-4545, or [john.delvecchio@maine.gov](mailto:john.delvecchio@maine.gov) for assistance, or visit the SPO's website at [www.maine.gov/spo/landuse/finassist/index.php](http://www.maine.gov/spo/landuse/finassist/index.php) for more information on these programs.

#### **DEPARTMENT OF TRANSPORTATION**

##### **Maine Safe Routes to School Program**

A new program in 2004 providing matching funds to improve safety for Maine children who bike or walk to school. Typical improvements include sidewalks, crosswalks and traffic signals, and improvements that separate children from traffic in school areas. The program is open to all Maine municipalities and school districts.

Contact John Balicki at the Maine Department of Transportation (207) 624-3250 or [john.balicki@maine.gov](mailto:john.balicki@maine.gov) for more information.

#### **MAINE STATE HOUSING AUTHORITY**

##### **Affordable Housing Subdivisions Financing Program**

The Maine State Housing Authority has created the Affordable Housing Subdivisions Financing Program ('Subdivisions Program'). In an effort to offer solutions to the affordable housing crisis and address sprawl, the Authority has made \$300,000 available to be offered in the form of forgivable loans to for-profit and nonprofit developers to build single family homes or a mix of single and multifamily housing in affordable housing subdivisions. Well planned subdivisions, financed through programs such as the Subdivisions Program, are one response to the affordable housing crisis in Maine's stressed areas and can also help to control sprawl. Contact the Maine State Housing Authority at (800) 452-4668 for more information.

##### **Affordable Housing Tax Increment Financing (TIF) Program**

A Maine community may use tax increment financing for affordable housing if it designates a district and adopts a development program approved by the Maine State Housing Authority. Some or all of the new property tax may be used to help pay authorized costs of those development projects. For more information, contact Julie Hashem or Michael Martin at (207) 626-4600 or [www.mainehousing.org/index.html](http://www.mainehousing.org/index.html).



## APPENDIX G

### HOW TO MAKE GROWTH AREAS WORK WITHOUT PUBLIC SEWERS: THREE APPROACHES PLUS “NONE OF THE ABOVE”

Prepared for the **Maine State Planning Office**  
April 2004

**Evan D. Richert, South Portland, ME**  
*In cooperation with*  
**Stone Environmental, Inc., Montpelier, VT**

*This report is part of a technical assistance series produced by the Maine State Planning Office to encourage traditional village centers, Great American Neighborhoods, and denser development patterns in communities that do not have centralized water or sewer systems. Large lot size requirements that exceed state minimum standards in locally designated growth areas have a significant impact on community character and encourage sprawling, dispersed development that is beyond the reach of municipal services. While lot-by-lot development is the least efficient way to manage land use and reduce many environmental impacts, it is promoted by current public policies that encourage private well and septic systems, make subdivision review expensive and onerous, and make the creation of Great American Neighborhoods nearly impossible. The technical assistance series seeks to provide current information about the capacity, feasibility, cost, and effectiveness of small-scale community water and wastewater systems; allay the fear of Maine communities about the fiscal, environmental, and management responsibilities of small-scale public systems and enable compact, neighborhood-style, and village-scale development in communities without central water or sewer systems. For more information, contact the Maine State Planning Office at [www.maine.gov/spo](http://www.maine.gov/spo).*

One of the stiffest challenges to implementing comprehensive plans is how to accommodate new development in locally designated growth areas that do not have public sewers. Many rural and suburbanizing towns in Maine face this question. They want to direct growth to the most suitable areas of town – near existing services, such as fire stations and schools, for example, or as extensions of existing villages – but have no prospect of public sewer lines to serve such areas. New development must rely on soils, usually on a lot-by-lot basis, to handle wastewater. The conventional wisdom says that means low densities of development, negating the effectiveness of a growth area.

The Town of Bowdoinham’s comprehensive plan, which is not usual, describes the situation:

*‘The Village has grown to its maximum residential capacity over the past 100 years. This is because the lot sizes are considerably smaller than in the rural areas. The lot sizes range from 1/4, 1/2, to 1 acre. Also the suitability of soils for septic systems is very poor.....’*

As a result, towns, in their land use regulations, do not feel able to make a meaningful distinction between densities of development allowed in their identified growth areas versus the rest of town or to take the steps needed to direct new development.

However, towns without public sewers have more options than they may realize. In this paper, we offer three approaches (and a fourth ‘none of the above’) to making designated growth areas without public sewers work. Each approach is based on situations adapted from actual adopted

comprehensive plans, in which the community has (explicitly or implicitly) designated growth areas that do not have public sewers. In each case, the lack of public sewers appears to be a barrier to implementing the plan.

The approaches focus on a strategy of relying on individual lots to provide either wastewater disposal or wells, but not both. That is, the strategy is to move one or the other of these functions into a community facility with related good management. The logistics of doing so are not complicated. The reliability of a community system, with management by a third party, is good, and the costs readily absorbed by the users of the system. The three approaches are:

- **Turnkey ownership of a community wastewater system by an existing Sanitary District:** Construction of a community waste water system to accommodate development on a single large property, with the system then turned over to an existing Sanitary District to own and manage;
- **New Decentralized Community Sanitary District:** Creation of a new community sanitary district established specifically to manage decentralized wastewater disposal from new development on two or more properties within a designated growth area, with construction in advance of such development; and
- **Taking advantage of public water supply:** In an area with public water supply, reliance on individual on site wastewater disposal, with assistance from the water utility issuing reminders and tips to homeowners for maintaining the system, and potentially to help with the actual maintenance.<sup>1</sup>

Please note that all the Case Studies, while borrowing from actual situations as described in comprehensive plans, are hypothetical. They are intended to be generic with applicability to many towns.

The last section, ‘None of the Above’, anticipates that many communities will continue the long practice of relying on individual wells and septic systems, even in their growth areas. It suggests that, even in that case, growth areas can be more meaningful than may be assumed.

### **CASE ONE**

#### **Turnkey Ownership of Community Wastewater System by An Existing Sanitary District**

**The Setting:** In Case One, the community is a well-established suburb. It is a geographically large town. A portion of the community is extensively developed and served by public water and public sewer utilities, which are managed by chartered districts. But the community also has an extensive rural area, a small part of which is a long-settled hamlet with a modest number of

homes and several small businesses. The area includes vacant land with potential and pressure for growth. The town in its comprehensive plan has designated this hamlet as a growth area, even though it has neither public water nor sewer and extension of public sewer lines will not occur in the foreseeable future.

**The Conditions:** The growth area contains approximately 433 acres (see Figure 1). Of this, approximately 200 to 250 acres already are occupied (estimated 100 to 125 homes and assigning an average of two acres per unit). About 85 acres are vacant but unbuildable due to wetlands, water table at the surface, and other natural limitations, leaving 100 to 150 buildable acres. The area lies on top of a moderate production (10 to 50 gallons per minute or gpm) sand and gravel aquifer, but there are no public wells in the area.

The buildable areas are dominated by deep, well-drained soils. In some cases the seasonally high water table is more than 48 inches below the surface, and in other cases the seasonally high water table is 12 inches to 30 inches below the surface. Some of the vacant, buildable land is contained in oversized lots of 5 to 20 acres, with single homes presently on the lots. Other vacant land is in larger parcels of 25+ acres.

**Estimating Building Potential:** To illustrate this case study, and to contrast the potential of a community wastewater system with the large lot model that is presently being employed in this growth area, we have selected a tract of about 45 acres that was developed as a contemporary subdivision of 19 lots averaging around 2 acres each.

*Figure 1: 433 acre growth area for Case One*





Most of the site is outwash parent material soils divided between somewhat excessively drained Adams loamy sand (depth to water table more than 5 feet, depth to bedrock more than 5 feet) and moderately well drained Crogan loamy sand (seasonal high water table at 12 to 30 inches, depth to bedrock more than 5 feet). About 6 acres are very poorly drained or have a high water table year-round. The site is not limited by steep slopes.

A community wastewater system can be located on a relatively flat area of the site with outwash soils, which requires a medium sized disposal field under Maine's Subsurface Waste Disposal Rules. It should be noted that – reflecting embedded fears by many communities – the community prohibits–'communal systems' over sand and gravel aquifers because 'eventually they can become maintenance problems' and lead to 'pressure to extend public sewer lines to solve the problem.' The management approach described in this hypothetical case study is aimed at this concern.

At a design flow of 10,000 gallons (approximately 37 3-bedroom homes), the site would need to dedicate 36,000 square feet (0.83 acre) of area for two leach fields for the community system, 20 feet apart. At a design flow of 20,000 gallons (74 homes), the site would need to dedicate 134,000 square feet (3.1 acre) of area for 4 leach fields, each 20 feet apart. (The area may be able to be reduced by using seepage beds or proprietary devices, such as Elgin in-drains.)

In addition, this case study assumes on site wells. No well could be within 300 feet of the leach fields.

Under the state's Minimum Lot Size Law, the case study site in theory could accommodate (with or without a community wastewater system) as many as 97 units (44.5 acres times 43,560 sq. ft., divided by 20,000 sq ft. per unit).

It is assumed, for purposes of this case study, that the units are single family homes and perhaps some townhouses. The leach fields, roads serving the development, and other unbuildable portions of the tract are not required by the Minimum Lot Size Law to be subtracted from the gross acreage before calculating the allowable number of units. Most local zoning ordinances, however, do impose a 'net acreage' rule. Further, the required distance between the leach fields and individual on site wells impose an additional practical limitation to the creation of lots. Finally, as will be discussed below, a Sanitary District that becomes involved in the ownership and management of the community wastewater system likely will require some reserve space for at least one leach field as a guarantee against having to get involved with difficult future land acquisitions to repair, replace, or expand the system.

All of these limitations reduce the practical number of potential lots and units to approximately 56, occupying about 31 of the tract's 45 acres. Thus, the average is about 1.5 units per net acre (and about 1.2 units per gross acre). With this approach, the case study parcel could safely accommodate more than three times the units actually built. Figure 2 is a 'bubble' diagram illustrating a traditional neighborhood layout using a community wastewater system—with a mix of townhouses and single family homes surrounding a green; and with poor soils near the front of the site reserved for open space.

**Managing the System:** Maine's Subsurface Waste Disposal Rules require that a 'single and independent' entity, legally established under Maine law, own and maintain a community wastewater system. This reflects the concern that community wastewater systems may otherwise suffer from lack of long-term maintenance. The entity must own all parts of the system beyond the building's backflow valve'— that is, all parts from the point of discharge to a septic tank and disposal field. This entity must have the authority and responsibility to operate, maintain, repair, and, if necessary, replace the system beyond the individual building's plumbing. It must have the authority to charge maintenance and other fees to assure sufficient capitalization to meet its responsibility; be provided an access easement recorded against the properties associated with or necessary for the system; and be granted a right of entry to the properties for the purpose of maintaining, repairing, or replacing any portion of the common system.

In the past, community systems have served primarily a development, such as a mobile home park, under a single ownership, or a condominium in which a legally established association of unit owners is a natural part of the arrangement. In this case study, a home owners' association also could be the legal entity to own and maintain the community wastewater system. It would be established by the developer and approved by the local planning board at the time of approval of the subdivision, and would be vested with the required powers and responsibilities.

However, there is a well-founded concern that, even with good intentions and a legal mandate, a small home owners' association run by volunteers may not be equipped to properly manage a

community system over a long term. Further, this form of shared ownership of common infrastructure, while not unusual, still is the exception rather than the rule in Maine, especially for single family detached homes; and this and the subsequent case studies seek to bring decentralized wastewater management into the mainstream and to offer approaches that fit with conventional models of development.

To achieve this objective, there is a good opportunity in situations such as presented here to bring existing management capabilities, in the form of

an existing sanitary district, into the picture. Even if the sanitary district's boundaries do not include the proposed development, Maine law allows a relationship between an existing sanitary district and new development:

*'Any sanitary district formed under this chapter is authorized to contract with persons, corporations, districts and other municipalities both inside and outside the boundaries of the district...to provide for disposal of sewage ...through the district's system and through the system of any such person, corporation,*

*district, or other municipality.'* (38 MRSA, Ch. 11, Sec. 1157)

In this Case, the approach calls for:

- Design and construction of the community wastewater system by the developer at his cost (can be done in phases; costs recovered through sale of the lots), according to specifications of the Subsurface Waste Water Disposal Rules;
- An up-front arrangement in which the Sanitary District jointly inspects the system with the Local Plumbing Inspector as it is being constructed;
- Dedication by the developer of all parts of the completed system, including septic tanks, lines, pumps (if any) and leach fields to the Sanitary District, analogous to the dedication of all public sewer lines in the extension of a conventional sewer system. The developer should discuss the location of septic tanks and lines with the Sanitary District at the time of the design of the system, and the planning board should require written evidence of approval of the system by the Sanitary District prior to subdivision approval. The Sanitary District will want to be sure that access to all elements of the system is easy, with all necessary easements in hand. Further, it is likely that the Sanitary District will want additional land set aside as part of the dedication for future use if necessary.
- Maintenance of the system by the Sanitary District, with user fees charged to the property

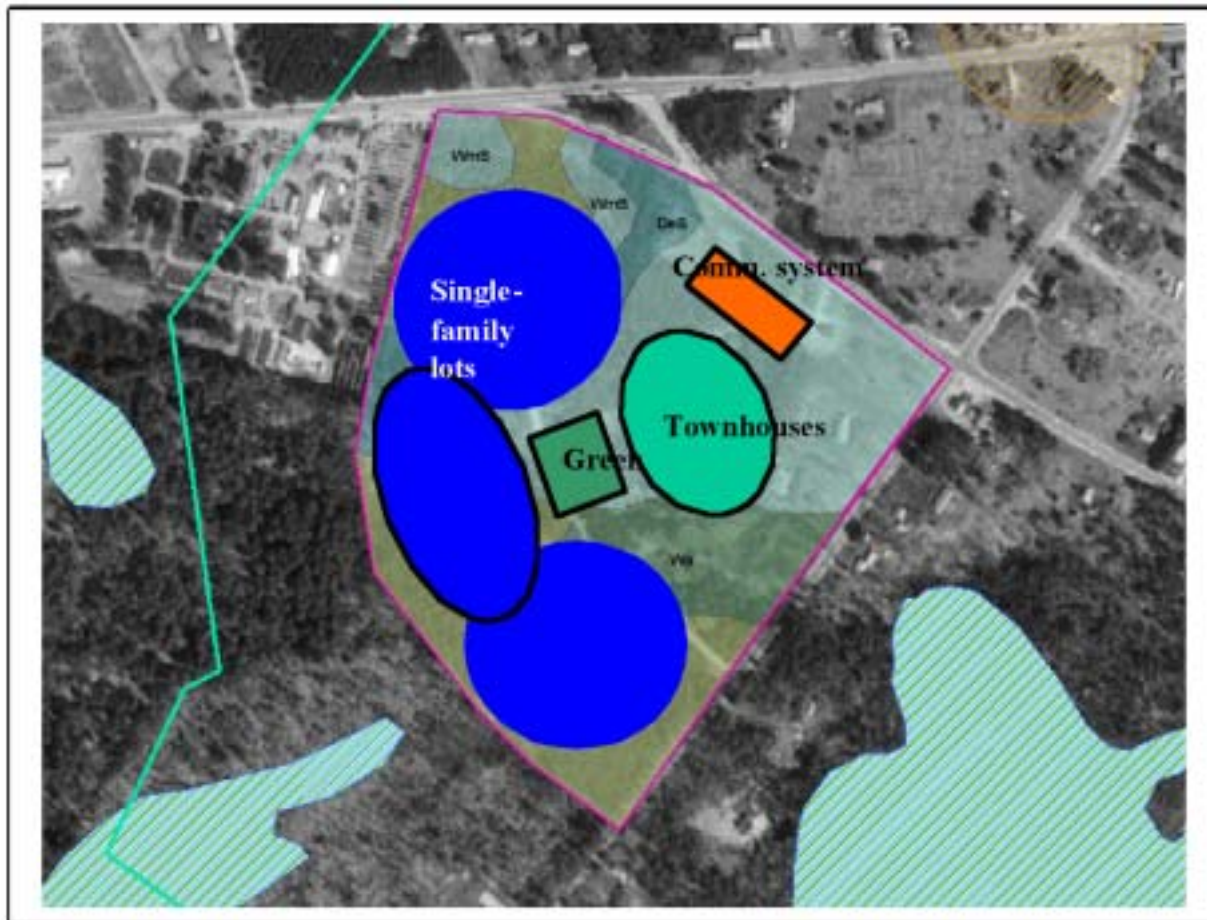


Figure 2: Traditional development with common septic



owners. (These may be a flat fee, or based on use to encourage water conservation, or other considerations.) Discussion with management of the Sanitary District in this Case Study suggests that such administrative aspects could be readily absorbed into the district's existing system.

Alternatively, the Sanitary District could maintain the community wastewater system under contract with a homeowners' association. In that case, the homeowners' association would be the responsible legal entity, but a condition of approval of the system and the subdivision would be a long-term contract with the District. The association would collect fees from home owners to pay for the contracted services.

In any case, the essence of this approach is to take advantage of an existing nearby Sanitary District (which need not be located in the host community) for professional, long-term management of community wastewater systems; and to employ user fees to pay for the management.

## CASE TWO

### New "Growth Area" Community Wastewater Sanitary District

**The Setting:** In Case Two, the community is a small (but geographically large), suburbanizing town with extensive rural lands throughout the town. It has designated three growth areas in different parts of the town, each around or near a long-time settlement.

The largest of the growth areas encompasses an existing village, a community school complex, and a westerly extension of the village along an arterial that already has some homes and small businesses (Figure 3).

The part of the growth area that extends from the village area along the arterial has been designated in the comprehensive plan as a 'planned development.' It was found to have acceptable soils for subsurface wastewater disposal systems, to not have major environmental limiting conditions, to have good road access, and it

already includes commercial activities. The comprehensive plan specifies that the district 'allow a mix of both residential and commercial uses,' with buffer and road landscaping standards.

While the comprehensive plan prescribes a mixed use area 'designed to shift development pressure from rural portions of the town' and 'able to accommodate the growth anticipated by this comprehensive plan,' the proposed lot sizes reflect perceived concern about subsurface waste disposal and are not conducive to an effective growth area. They are one acre per residential



*Figure 3: Growth area for Case Two*

unit and two acres for each commercial use.

**The Conditions:** The growth area contains a total of just less than 975 acres, including both the village and the ‘planned development’ area to the west. Nearly two dozen of the parcels within the growth area each contain 10 or more acres, up to 100+ acres. They total more than 700 acres. Many of these have a single family home associated with them, but most of the land is vacant. A fair amount of lot-by-lot development exists along the frontage of the main road, but large tracts of vacant land lay behind this development either side of the road. The land includes a mix of active and abandoned farm fields and woods.

The area is not served by public water or public sewer, and no sewer or water utility districts serve the town. Soils are dominated by fine and very stony fine sandy loams, which are moderately to excessively well drained. Large portions of the area have bedrock 18 inches below the surface, but in other portions, bedrock is more than 5 feet deep. Some wet soils and small wetlands exist along drainage ways. Topography is not a limiting factor. Two small public wells exist within the area.

**Estimated Building Potential:** This case study focuses on two contiguous, primarily vacant parcels totaling 139 acres located within the designated ‘planned development’ part of the growth area. (See Figure 4.) The parcels are within walking distance of the community schools and nearby convenience goods and services. They also have good access to the area’s transportation system, including the Maine Turnpike.

About half the site is Lyman fine sandy loam,

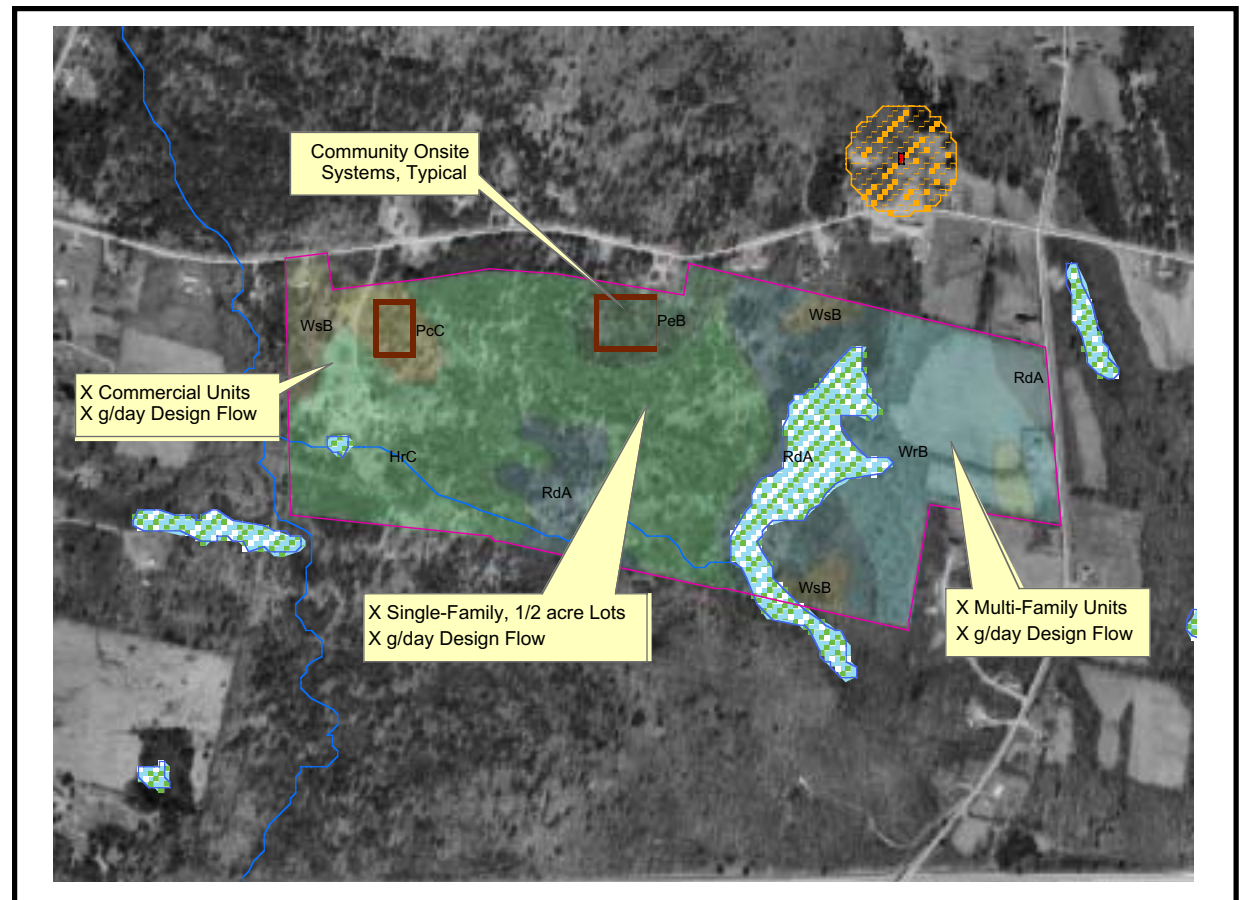


Figure 4: Development parcels in Case Two

which is well drained but shallow to bedrock. About a quarter of the site is Peru fine sandy loam or very stony fine sandy loam, both deep and moderately well drained. About a fifth of the site is Brayton very stony fine sandy loam, a portion of which is associated with a drainage way and wetness, including about 18 acres that are unbuildable. Smaller inclusions are of the Marlow series, which are fine sandy loams, deep and well drained.

Two of the Marlow inclusions are well located for easy access and sufficient distance (at least 300') from wells and a quarter mile from the closest

small public well. Subsurface wastewater disposal fields in these soils must be designed using the medium large rating.

The buildable area within the two sites is an estimated 121 acres. In the spirit of the planned development district, a portion of the land could be earmarked for small-scale commercial activity. A community wastewater disposal system located on a Marlow soil with a design flow of 20,000 gpd would require, including provision for setbacks, just less than 5 acres of land. The area



may be able to be reduced by using seepage beds or proprietary devices. The number also may be adjusted based on a hydrological nitrate plume study. The design flow would accommodate a mix of commercial activity; for example: a small restaurant and lodging facility, offices with up to 100 employees, a small (10-machine) laundry, and small stores with up to 100 employees. This mix of activity, following the kinds of design standards implied by the town's comprehensive plan, might require on the order of 20 acres, including parking (note: if desired, it also could be designed compactly, in more of a village style, which would require less land).

This would leave about 100 acres for residential purposes, including open space. Again, in keeping with the concept of 'planned development,' this may be an ideal area near the schools for a mix of small-scale multifamily development and single family homes. In theory, the Minimum Lot Size Law would allow more than 200 dwelling units on the 100 acres. However, following the normal zoning protocol of subtracting out acreage dedicated to the community waste disposal system, streets, etc., reduces that number to 150 units.

The size of the community wastewater system needed to accommodate this number of units depends on the mix of residential units. The area available for the subsurface wastewater disposal system for this portion of the development is about 4 acres and could accommodate a flow of at least 31,500 gpd. This would support 150 units if 100 were 2-bedroom apartments and 50 were 3-bedroom single family homes. Alternatively, it could support 50 2-bedroom apartments and 80 single family homes or 25 2-bedroom apartments and 100 single family homes.

In any case, these numbers suggest that this one portion of this one growth area could safely absorb 30% to 40% of all the housing growth forecast by the comprehensive plan to occur in town over the next decade. The overall density of the residential portion of the development would be 1.2 to 1.3 units per gross acre.

The community wastewater system also would require a 300-foot setback from individual wells, which would increase the area earmarked for the system to about 7 acres. The multifamily units might utilize a community well. If so, the wellhead protection area may contain an area larger than the 300-foot radius, particularly in the up gradient direction.

In sum, the potential development program for this illustration might be:

- 6 to 10 small businesses with off-street parking
- 25 to 50 2-bedroom apartments
- 80 to 100 single family house lots
- 20 to 25 acres of open space (including preserved wetland)
- 2 community subsurface wastewater systems, one for the commercial activity and one for the residential, using about 12 acres of land, including land for setbacks that can become part of the open space system
- a community well for the multifamily units.

**Managing the System:** Title 38 of MRSA, chapter 11, provides the town with the tools needed to implement its 'planned development' vision for this growth area. This law enables communities to establish Sanitary Districts covering a whole town, *a section of a town*, or a combination of towns. At the end of this section, we will discuss the limitations of, and possible

amendments to, the current law in the context of decentralized wastewater disposal.

The district's mission would be to own and operate small-scale, community underground wastewater disposal systems serving the designated growth area, which would be its defined jurisdiction.

Working with owners of developable tracts of land in the growth area, the district typically would acquire land for community wastewater systems in advance of development. The district would finance the construction of the leach fields (the treatment system) as it saw fit, potentially in phases, and likely through a combination of 'readiness to serve' charges to the benefiting property owners and low-interest loans from the State Sewer Revolving Loan Fund. As land in the growth area is developed, the developers would be responsible for installing the collection system (septic tanks and lines to the wastewater field(s)) at their cost according to specifications of the district and the state's wastewater disposal rules. Once completed and inspected, the collection system would be turned over to the district, which through easements would have the right and responsibility to maintain the collection system, including periodic pumping of septic tanks, as well as the leach fields. Property owners connected to the system would be charged monthly fees to pay for the operation and maintenance of the system, including outstanding loans, just as property owners connected to conventional public sewer systems are charged such fees.

If a proposed development were large enough, the developer and district also would have the option to have the developer construct the community wastewater field(s) for dedication to the district

upon completion. This approach would be viable if (1) the district has not yet built a facility accessible to a particular developer's land and (2) the developer believed the size of the development and pace of sales would allow recovery of the capital costs of the wastewater facilities within a reasonable period of time.

In any case, the town's land use regulations must establish, up front, that:

- Consistent with the stated intentions in the comprehensive plan, land in the growth area could be developed at a density of no less than 2 units per net residential acre (and no more than the density allowed by the State Minimum Lot Size Law, which is 1 unit per 20,000 square feet of gross area); and
- All properties intended to be served by the community wastewater systems are required to connect to them as they are developed. This requirement is typical of all public sewer districts. Pre-existing development within the area would not be required to connect, and indeed may not have the choice to unless the system was sized to handle extra wastewater flows (in addition to flows anticipated from new development). If problem systems exist in the area and need an alternative, the community system may be consciously designed to bring them in. This, in turn, may qualify the system for grants or low interest loans through the district.

### **Amending Title 38, Ch. 11, to Meet the Needs of Decentralized Wastewater Management Systems:**

In its present language, the Sanitary District Act is quite flexible to meet the needs of communities in different situations. However, because the bulk of it was written 20 to 30 years

ago, little specific provision is made for (1) subsurface wastewater disposal – the bias is toward discharges to surface waters, or (2) decentralized community systems— the assumption was that ‘public sewer system’ means large-scale and centralized.

Several procedural requirements and some of the powers and authorities of a sanitary district may not be needed or appropriate for decentralized community systems that essentially serve a single neighborhood. For example, a sanitary district can only be established within a community upon the filing of an application with the Board of Environmental Protection (BEP) by the municipal officers, a positive finding by the BEP, and a referendum vote by ‘the legal voters residing within the portion of the municipality, municipalities or unorganized territory that falls within the proposed sanitary district.’ In the case of decentralized community systems serving a relatively small number of properties, decisions by the municipal officers in consultation with the affected land owners and by the BEP may be sufficient. Further, certain powers of a typical sanitary district, in particular the power of eminent domain, may be unnecessary in the case of decentralized community systems, and perhaps should simply continue to rest with the municipality.

We propose that the Sanitary District Act be amended by recognizing the somewhat hybrid nature of a Decentralized Community Sanitary District which has the size and jurisdiction of a large property owners' association but must have the powers to fulfill the requirements of an ‘independent entity’ under the terms of Maine's Subsurface Waste Disposal Rules. This amendment should be inserted as part of Section 1163-A of the act, dealing with coordination of

municipal planning. Its focus should be on enabling small-scale districts for the purpose of managing community wastewater disposal systems that will specifically aid in the implementation of designated growth areas in approved comprehensive plans.

Suggested enabling language is included in Attachment A.

### **CASE THREE**

#### **Taking Advantage of Public Water Supply**

**The Setting:** The community is a small, largely rural but suburbanizing town with an established village. It has not explicitly designated growth areas in its comprehensive plan – due in part to the interspersed soils suitable and unsuitable for subsurface waste disposal. However, throughout the town it has identified lands that are—‘most suitable for residential growth’ and areas ‘somewhat suitable for residential growth’— that is, relatively free of natural constraints. Some of these lands lie to the north of the village, close to a fire station and other public and commercial services. (See Figure 5.) Most importantly for this case study, these lands have access to a public water supply.

**The Conditions:** The public water lines serve primarily the village but radiate out several roadways to the north and west of the village. The lines are owned and the water is delivered by an independent public utility district regulated by the Public Utilities Commission.

The soils on vacant lands in the vicinity of the water supply service area include large areas of Buxton silt loam, which is deep and moderately well to somewhat poorly drained; Suffield/





*Figure 5: Development parcels in Case Three: a small rural, but suburbanizing town*

Buxton silt loam, which is deep and well drained, but some of which is associated with steep slopes along drainage ways; Lyman fine sandy loam, which is somewhat excessively drained and fairly shallow to bedrock (10 to 20 inches); and Scantic silt loam, which is hydric and usually indicative of a wetland and in which subsurface wastewater disposal generally is not feasible.

For Case Three, an undeveloped tract (Figure 6) was identified that has access to the public water

line, is within a short distance of the village and close to public services such as fire protection, and that, according to the town's comprehensive plan, is relatively free of natural constraints to development.

**Estimated Building Potential:** This site contains a total of about 23 acres of buildable area (i.e., not in flood plains, wetlands, etc.). Its soils are almost entirely silt loam, moderately well to poorly drained and deep to bedrock. This

Case relies on individual subsurface waste disposal systems. On these soils, the systems would be a medium large rating for the Lyman soils (3.3 sq.ft./gallons per day or sf/gpd) requiring systems covering approximately 900 square feet, and extra large for the Buxton soils (5.0 sf/gpd), requiring systems covering approximately 1,350 square feet of each lot for 3-bedroom homes. Reserve sites are not required or, in the opinion of state regulators, necessary. They are, however, required by some local subdivision ordinances. If they were included, up to 2,700 square feet of each lot would be given over to the subsurface system.

Even so, especially because the lots will tie into public water supply lines and therefore will not have to incorporate setbacks from wells, the state's minimum requirement of 20,000 square feet per lot can easily and safely accommodate a typical 3-bedroom home, garage, and sizable yard plus the subsurface and related reserve system. After reducing the buildable area by land required for streets and after setting aside additional land for open space and to allow for buffers along natural drainage channels that cross corners of the site, there is ample space for 35 lots on the site. This translates into about 2.1 units per net acre and 1.4 units per gross acre. Because it is hard to envision 'density,' Figure 7 on the next page illustrates what part of the total site would actually be occupied by 35 half-acre lots if they were lined up next to each other; and what part of the lots would be given over to the footprints of homes and septic systems. The actual layout, of course, would involve streets, planned open space, preserved natural areas, etc.; and the actual configuration of lots would include some larger than 20,000 square feet.



Figure 6: A 23-acre parcel of land in Case Three within close proximity to the village center.

**Managing the Systems:** Each property owner will own and manage his/her individual septic system. State regulators and soils scientists are confident that, with contemporary site evaluation, site inspection, and installation practices, the systems will perform effectively without danger of malfunctioning or of contaminating groundwater. However, with the presence of a water utility that will be providing water to the homes, there is an opportunity to implement a systematic education and reminder system to help

insure that the systems are in fact properly maintained and perform well over the long term.

Under this approach, the town would enter into an agreement with the water utility in which the utility agrees to send, along with the utility's already required annual report to customers on the quality of its water supply, an annual educational piece about maintenance of septic systems and reminding them of the importance of pumping and other scheduled routines. The



Figure 7: Land area that would be used by 35 1/2 acre lots, and the part of the 35 lots that would actually be occupied by building footprints, driveways, septic systems and streets.

educational piece could be prepared by the town – e.g., the local plumbing inspector—the regional planning agency, or state Division of Health Engineering for inclusion in the mailing. The cost of this effort would be minimal, but it could be defrayed by a requirement at the time of subdivision approval that the developer provide a fee to the town to prepare the piece, to pay for any extra mailing costs, and to create a small fund for keeping it up to date.



## NONE OF THE ABOVE

### An Important Perspective on Subsurface Wastewater Disposal

Some communities may not be in a position to implement approaches that take advantage of existing sanitary districts, new community sanitary districts, or public water supplies. Even so, the science, practice, and rules of subsurface wastewater disposal have advanced sufficiently over the last quarter century that some of the widely held notions that stymie good ‘growth’ areas are no longer valid. It *is* possible, following state subsurface wastewater disposal rules and good management practices, to have effective ‘growth’ areas that depend on individual septic systems and wells.

#### Correlation between soils and lot size:

**The most important change in thinking is that, above the 20,000 square foot requirement in state law, there is not a strong correlation between soils and lot size required for septic systems.** A quarter century of experience under Maine’s plumbing code has found that it is system design, installation and maintenance, and separation distances, not lot size, that count.

A word of history: In 1974 Department of Health Engineering (DHE) overhauled the rules for subsurface wastewater disposal. Among other things, it replaced percolation tests with a much more detailed and scientific site evaluation procedure to determine the suitability of the soils into which wastewater from septic tanks would be discharged and the type of system required. It required the evaluation to be undertaken by a licensed site evaluator. It established standards for the design of subsurface waste disposal fields. And it continued to require minimum distances

between a septic system leach field and wells and property lines.

At the time, the DHE believed that a combination of factors still warranted a heavy dose of caution. These factors included the differing abilities of various soils to treat wastewater, the use of leach fields sized to soil conditions, and the suspicion that—with neither trained inspectors nor trained installers—systems might still be installed close to or even into the seasonal water table such that the soils wouldn’t be able to perform their intended function. The caution got expressed in the form of a chart with recommended lot sizes based on different soils profiles and conditions. The lot sizes were not required; they were guidelines that were attached to the new plumbing code in an appendix.

The recommended lot sizes ranged from the minimum of 20,000 square feet that is in Maine’s Minimum Lot Size Law to 80,000 square feet (and, in certain situations, no system was deemed feasible). These guidelines were widely used by towns and planners in the drafting of comprehensive plans and zoning ordinances. As an extra measure of safety, many towns simply went right to 40,000 or 80,000 square feet (or 1 or 2 acres) as the minimum. They reasoned that soils dictated not only the size of the disposal field but also a dispersal area beyond the fields—and that more dispersal area would be an extra guarantee against contamination from failed systems and need for local intervention. In 1979, the Department of Environmental Protection (DEP) incorporated a similar chart, with minimum lot sizes also ranging from 20,000 square feet to 80,000 square feet, into its rules governing soils standards under the Site Location

Law (Chapter 376: Soils Type Standards of the Site Location Law).

The use of lot sizes as a surrogate to protect water quality was not unwarranted. A number of studies across the U.S. found a relationship between relatively high densities of systems and water quality, especially with relation to nitrates. The generally recommended minimum lot size necessary to ensure against contamination was found to be around 0.5 to 1.0 acre (20,000 to 40,000 square feet).<sup>2</sup> However, few if any of the studies took into account design of the systems, many of which had been designed and installed under minimal regulation; and few if any of the studies were of systems installed under rules such as had been enacted by Maine.

In 1995 the Maine Subsurface Waste Water Disposal Rules were again revised. These rules changed the structure, format, and certain administrative provisions of the code; and they recognized the advent of new proprietary devices for subsurface wastewater disposal. But the technical provisions governing system design established in 1974 did not significantly change. DHE and soils scientists (including the State Soil Scientist) already had recognized for some time that in fact there seemed not to be a meaningful connection between soils used for properly designed subsurface wastewater disposal and lot size in excess of 20,000 square feet. Twenty years of experience had shown that systems designed to standards could be accommodated, in most instances, on 20,000 square foot lots, without impact to water supplies regardless of soils type. The appendix containing the chart of lot sizes was dropped from the new rules. The Maine DEP’s rules still include its analogous chart, but it is rarely used and probably should be repealed.

Why did DHE and others reach this conclusion?  
Several reasons:

**1. Experience with septic systems built under the new 1974 code was good,** both with new systems on relatively large lots and with replacement systems on small lots. Soils were now more accurately classified. The design of fields, including their size and construction standards, was far superior to pre-1974 systems. The DHE received few reports of failures, even of replacement systems on lots smaller than 20,000 square feet and even after systems had aged. When a failure was reported, it could be attributed to faulty design, installation, or maintenance, not to flaws in the code. A 1999 study by the DEP and the Maine Geological Survey found 99.6% of a sample of wells on lots using septic systems met standards for nitrates. The lots were located in 18 different subdivisions, and sizes in the sample ranged from 0.3 acres to 33.8 acres, with a median in the range of one acre (that is, half were smaller and half were larger than one acre). That study also recommended that septic system installers be licensed.<sup>3</sup>

**2. Professionalism among site evaluators, local plumbing inspectors, and installers of septic system has steadily improved.** Site evaluators have had to be licensed since the 1970s. Since 1988, local plumbing inspectors have had to be certified under the state's Code Enforcement Certification Program. Many installers of systems submit to voluntary certification. There is still room for improvement—especially in the education of homeowners on proper use and maintenance of their systems; but 'guessing' and error have been reduced dramatically. Science and knowledge have increasingly replaced assumptions and luck, with good outcomes.

**3. Standards for design and installation of systems are meant to assure that most pollutants are removed in the leach field** or, in any case, never reach groundwater used as a drinking supply by that lot or nearby lots. A major advance in rural wastewater treatment is that today's septic systems are in fact designed to treat the wastewater, not simply convey it underground. Old practice tolerated an 'out of sight, out of mind' attitude. Current practice is to treat the constituents of wastewater before they exit the system, and to capture the residuals in suitable soils before they reach bedrock or the water table. An example of this shift in attitude is the practice, which has become standard, of building 'at-grade' or 'shallow' leach fields. These infiltration fields are not sunk into the ground, but rather are built within or above the top 12 inches of the native soil. In these top 12 inches, the action of microbes and plant roots are most effective. In one study in Addison County, Vermont, such a system was shown to remove 99% to 100% of fecal coliform and 89% to 99% of phosphorus within three feet down-gradient of the field. There also are a number of advanced treatment systems and products that can treat the wastewater if the soils on a site are limited in their ability to do so.

A large percentage of Maine's soils have a natural hydrological barrier above the bedrock into which wells are drilled for drinking water. The barrier may be a clay soil or a hard pan that slows or prevents the flow of water through it. At one time these barriers were thought to be a disadvantage for subsurface waste disposal, since they can occur within a few feet of the surface of the ground and water perches on top of them. But combined with systems designed to treat and not merely discharge waste, and with a required separation of 12 to 24 inches between the bottom

of the system and this restrictive layer, constituents of wastewater that escape the system—such as nitrates and household chemicals that are thoughtlessly poured down the drain—are unlikely to reach the source of a lot's water supply.

At the same time, as we consider system design on individual lots, it is important to keep in mind a large area view. A density of one to two septic systems per acre over a large portion of a bedrock aquifer can result in a regional overload of the attenuation capacity of till and marine clay soils. Compact development in a small proportion of a town, designated as growth areas, should be reviewed at the comprehensive planning stage to assure that this will not contribute to a regional degradation of water quality. In general, as envisioned by Maine's Planning and Land Use Regulation Act (Growth Management Act), relatively compact development in 'growth' areas should be offset by low densities of development in 'rural' areas of town.

**4. The required separation distance (100 feet) between leach fields and on site wells appears appropriate.** The 1999 DEP-Maine Geological Survey study concluded 'that the Maine Subsurface Waste Water Disposal Rules are adequately protecting residential wells from NO<sub>3</sub>-N contamination caused by conventional septic systems.' A separation distance of 100 feet (plus distances from property lines) can be met on 20,000 square foot lots in most instances. (DHE does not require reserved space for replacement systems. If reserve space is required by local ordinance and fields are large, more than 20,000 square feet may be required.) Further, in 1994 Maine put into effect the Well Driller and Pump Installer Rules (144 CMR 232). The rules have helped assure that new wells being drilled



are located at least 100 feet from existing septic systems.

**In short, there is not a strong, scientific argument for requiring overly large lots simply because they will rely on subsurface wastewater disposal.** There may well be good justification for requiring large lots – in the designated ‘rural areas’ of a comprehensive plan, for example—but those reasons are for other than subsurface wastewater disposal. Within growth areas, the lots must of course be larger than if served by an off-site public system, because dispersal and separation distances between septic systems and wells do require space. But it would be unusual if standards could not be met on 20,000 to 30,000 square foot lots, even absent the approaches described earlier in this paper.<sup>4</sup> **Lots in this range can make for very viable hamlets, villages, and similar growth areas.** Smaller lots in designated areas also can be used to divert development from areas that are a source of public water supplies to the village or hamlet.

### Exceptions and precautions

Maine’s geology is variable. Certain situations call for particular caution. Maine’s Subsurface Waste Water Disposal Rules anticipate these situations in large part, but certain other best practices also come into play. These situations include:

- **Locations near wellheads of public water supplies.** These wellheads likely will be located in sand and gravel aquifers. Land uses within the zones surrounding the wellheads, including septic systems, must be limited and best management practices, including extended separation distances, employed.<sup>5</sup> For public supply wells in sand and gravel aquifers, upon

which a heavy demand for withdrawals are made daily, the most sensitive wellhead protection zone is measured by a travel time of 200 days, which is the expected life of viruses in groundwater.

In general, designated growth areas should not encompass these wellhead protection zones. Towns are now receiving information about the location of public water supply source protection areas during the comprehensive planning process. The expectation is that growth areas will be located to avoid these areas wherever possible. There may be conflicts between small public water systems, like schools, and nearby growth areas. Hydrogeologic review at the comprehensive planning stage can help to reduce these potential conflicts. Overall density in a watershed is still an important tool in planning for long-term development. Clustering that development demands that other areas be kept at a very low density to avoid regional problems.

- **Shallow bedrock (less than 3 feet) or coarse sand and gravel soils.** If such conditions are present and there is not a **hydrologic barrier** between the septic system and either the bedrock or the water table, there is concern that wastewater may reach drinking water. This does not necessarily affect lot size, but rather demands careful attention to the design, installation, and maintenance of septic systems. In shoreland zones the design includes installing a liner. As discussed earlier, installing the system ‘at grade’ to take advantage of the treatment action in upper soils is important. In addition, wells should be drilled to depths of more than 100 feet and be installed with long casings set and grouted into the bedrock.

- **Development on significant slopes.** Multiple septic systems on slopes with wells downhill of them increases the risk of nitrate contamination of the wells. The layout of the lots and their septic systems and wells need to be carefully considered. The density of systems above wells should be limited. Alternatively (or in addition), readily available pre-treatment technologies can be added to reduce nitrogen
- **Development in the sub-watersheds of nutrient-sensitive lakes and estuaries,** especially where land uses are underlain by coarse, unconsolidated sediments. For example, a series of studies of nitrogen loading in the sub-watersheds draining to Waquoit Bay on Cape Cod increased with density of septic systems, with effects on crucial sea grasses and eutrophication. There was not a one-to-one translation of land use to nutrient loading, but a clear relationship nonetheless. The tested sub-watersheds ranged in area from about 150 acres to about 6,700 acres, and the density of development ranged up to just under 2 units per acre.<sup>6</sup> Such sub-watersheds should not, as a general rule, be part of designated growth areas; and probably should call for very low densities (less than the typical unit per 2 to 5 acres); and in any case should preserve healthy natural buffers between development and surface waters.

## END NOTES

<sup>1</sup> EPA's voluntary management models 1 and 2; see Stone Environmental's white paper, 'Management, Policy Options, and Guidance for Water Supply and Decentralized Wastewater,' prepared for the Maine State Planning Office, 2003.

<sup>2</sup> See, for example, the literature review in Bicki, Thomas J., and Brown, Randall B. March/April 1991. 'On-Site Sewage Disposal: The Influence of System Density on Water Quality. ' *Journal of Environmental Health*, vol. 53, no. 5.

<sup>3</sup> Pinette, S.R. and Noble, W.T. July 1999. *Residential Septic System Impacts on Groundwater Quality in Maine Parts I and II*, (Augusta: Maine Department of Environmental Protection).

<sup>4</sup>As indicated, DEP still has a rule under the Site Location Law that recommends minimum lot sizes based on soils. According to staff at DEP, this aspect of the rule is rarely used and largely forgotten; there appears to be no strong scientific basis for it. Rather, the Department examines the results of nitrate analyses to determine if a proposed development meets its groundwater standards. The important variables in these analyses are slope of the groundwater table, the location of septic systems with respect to proposed wells, permeability of the soil, amount of precipitation, and gallons per day discharged into the system. The resulting density of lots may be smaller or greater than that prescribed in the rule. Although the chart of lot sizes apparently is largely irrelevant, it is worthwhile to note that it includes 27 categories of soils profiles-and-conditions. Seventeen of these profiles and conditions call for minimum lot sizes of 20,000 to

34,000 square feet; only 4 call for lot sizes as large as 80,000 square feet.

<sup>5</sup>See Maine Rural Water Association. Sept. 20, 2003. *Best Management Practices for Groundwater Protection: A Guide for Public Water Suppliers and Local Officials*, (Augusta: Maine State Drinking Water Program).

<sup>6</sup>Valiela, Ivan, et.al. December 1992. 'Couplings of Watersheds and Coastal Waters: Sources and Consequences of Nutrient Enrichment in Waquoit Bay, Massachusetts.' *Estuaries*, vol. 15, no. 4.

*The author thanks Russell Martin (Maine Division of Health Engineering), Andrews Tollman (Maine State Drinking Water Program), David Rocque (State Soil Scientist), Paula Thomson (Maine Rural Water Association), Bob Marvinney (Maine Geological Survey), and Mary Clark (Stone Environmental, Inc.), as well as the Maine State Planning Office's Community Systems Advisory Group for their reviews and comments. Any errors are solely the author's.*

## ATTACHMENT A

### PROPOSED AMENDMENT TO MAINE SANITARY DISTRICT ENABLING ACT TITLE 38, CHAPTER 11

#### §1101. Formation

The formation of a sanitary district is accomplished as follows, unless a municipality chooses to establish a decentralized community sanitary district, in which case the decentralized community sanitary district shall be formed pursuant to §1163-A.

#### §1163-A. Coordination with municipal planning

To facilitate coordination of municipal planning and sewer extension planning and development of areas designated as growth areas in comprehensive plans approved under Title 30-A, Chapter 187, Sec. 4347-A:

#### A. Cooperation between sanitary districts and municipalities

**1. Sanitary districts.** The trustees of a sanitary district shall cooperate with municipal officials in the development of municipal growth management and other land use plans and ordinances; and

**2. Municipalities.** Municipal officers shall cooperate with the trustees of a sanitary district during the consideration of development applications that may affect the operations of the district.



## **B. Decentralized community sanitary district**

**1. Definition.** A decentralized community sanitary district is a sanitary district formed to manage one or more subsurface waste water collection, treatment, and disposal systems constructed according to the requirements of the Maine Subsurface Waste Water Disposal Rules to accommodate non industrial development entirely within one or more areas designated as growth areas in a comprehensive plan approved under Title 30-A, Chapter 187, Sec. 4347-A.

### **2. Formation.**

- a. A decentralized community sanitary district may be formed only if no sanitary or sewer district formed under this chapter or other state law exists with jurisdiction to serve the geographic area or areas in question.
- b. Formation of a decentralized community sanitary district is accomplished in the same manner as a sanitary district under this chapter, except submission to the voters is not required and, following the joint meeting as required in §1101 between the commissioner and the municipal officers or others named in the application for a decentralized community sanitary district, the trustees shall be appointed by the municipal officers of the municipality or municipalities in which the designated growth area or areas are located. The terms of the trustees shall be determined in the manner set forth in §1105.
- c. Upon approval by the board of the application for a decentralized community sanitary district, the commissioner shall issue a certificate of organization in the name of the decentralized

community sanitary district in such form as the commissioner shall determine. The original certificate must be delivered to the trustees on the day that they are directed to organize and a copy of the certificate duly attested by the commissioner must be filed and recorded in the Office of the Secretary of State. The issuance of a certificate by the commissioner is conclusive evidence of the lawful organization of the decentralized community sanitary district. The district is not operative until the date set by the commissioner under §1106.

**3. Powers.** Unless otherwise stated in this section, each decentralized community sanitary district formed under this section shall have the same powers and duties as a sanitary district formed under this chapter, except the right of eminent domain, which shall remain with the municipality or municipalities in which the decentralized community sanitary district is operating.

**4. Connection of new sewers.** Every new building in a decentralized community sanitary district formed under this section intended for human habitation or occupancy or with facilities for discharge of non industrial waste water shall have a sanitary sewer system which shall be caused by the owner or person against whom taxes on the premises are assessed to be connected with the facilities of the district, upon written application to and approval of the connection by the trustees of the district. The trustees may require the owner or person proposing a new building or facility to construct at his or her cost a subsurface waste water disposal system sufficient for the development according to the Maine Subsurface Waste Water Disposal Rule, for inspection by, dedication to, and ownership and management by the district.

If, within 60 days of written application to the district, the district does not direct the owner or person to connect to an existing subsurface waste water facility or to construct one for ownership and management by the district, the owner or person may construct the necessary waste water disposal system to serve the new building or buildings separate from the ownership by and operations of the district, provided all applicable state and local regulations are met.

**5. Connection of existing sewers.** Buildings within the decentralized community sanitary district existing as of the operative date of the district that are already served by a private sewer or septic system shall not be required to connect with any sewer of the decentralized community sanitary district; nor shall the district be obligated to accept into its system the private sewers or septic systems of buildings existing as of the operative date of the district. Nothing herein shall preclude a voluntary agreement for accepting such pre-existing private sewers or septic systems into the community waste water facility.

**6. Expansion of decentralized community sanitary district boundaries.** The boundaries of a decentralized community sanitary district may be expanded by the municipal officers if the designated growth area boundaries within which the district operates are expanded pursuant to an amendment of the comprehensive plan approved under Title 30-A, Chapter 187, Sec. 4347-A. The district's jurisdiction may not extend beyond the boundaries of one or more designated growth areas.